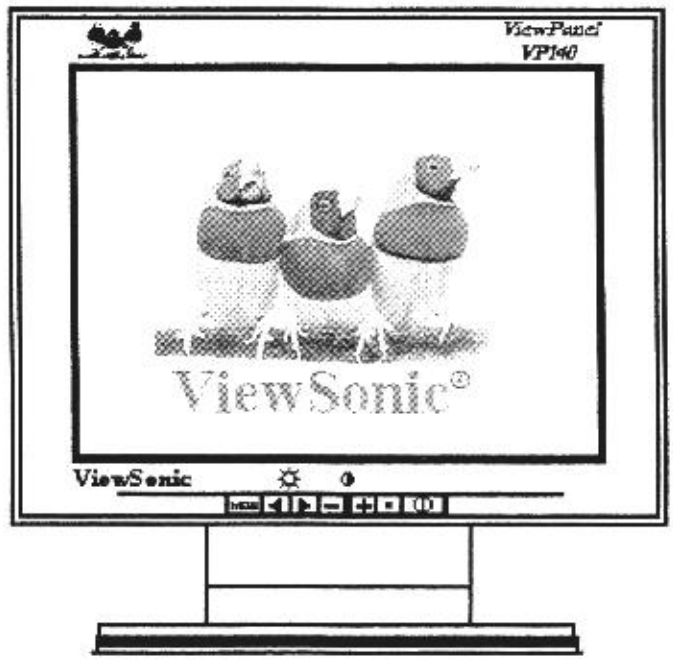
Service Manual

ViewSonic VP140 ViewPanel™

Model No. VSLCD101-1

14" Active Matrix LCD Color Monitor



(Rev. 1 - June 1997)

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3) Fluorescent lamps

The lamps are installed at the top and bottom of the LCD panel and illuminate it from behind. Originally, this is a part of the LCD panel unit, but this is included in parts for repair, because it is consumable.

The lamps are supplied in a set of upper and lower lamps. Hence, replace a set of lamps, even if either of them is found defective in repairing service.

4) Inverter PCB

This is a printed circuit board for lighting on and off the fluorescent lamps. A whole PCB unit is to be repaired, thereby no independent replacement of components being accepted.

5) AC adapter

This is an adapter to convert from AC to DC. A whole adapter unit is to be repaired, thereby no independent replacement of components being accepted.

4 As you understand from the explanation above, the service manual for STEP-1 is prepared with the replacement of a unit forming the main part of it.

As a matter of your information, all the parts list of components to be supplied are included herein.

GENERAL DESCRIPTION OF LIQUID CRYSTAL DISPLAY (LCD) PANEL

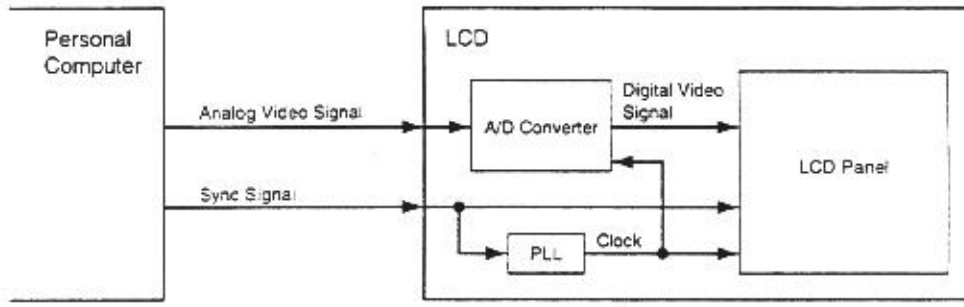
1 LCD Basics

1-1 Figure 1 shows a basic LCD model. Images can be reproduced by applying the following three kinds of signals to the LCD panel.

(1) Digital video signal
(2) Synchronizing signal
(3) Clock

Similar to the CRT scanning lines, the digital video signal (1) scans from the upper left corner to the lower right corner of the screen according to the synchronizing signal (2).

Fig. 1 Basic Model of LCD



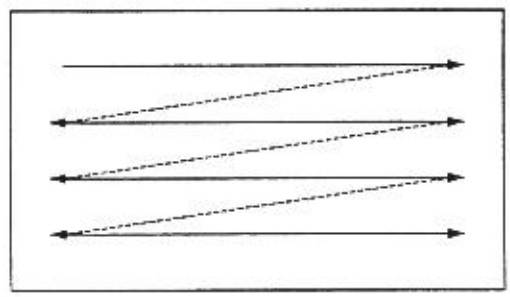


Fig. 2 Video Data Scan Image

1-2 LCD Panel (Pixel Configuration)

The LCD has its pixels completely separated in lattice form as shown in Figure 3.

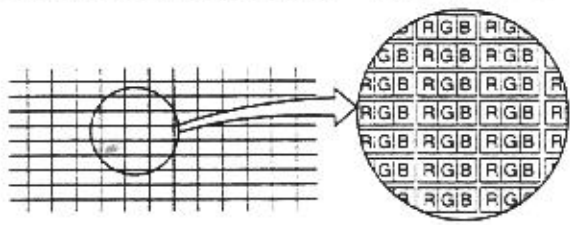


Fig. 3 LCD Pixel Configuration

The above pixel configuration provides the LCD with the following features.

(1) Good inter-pixel optical transient characteristics
Characters are easy to read because of sharp separation of dots.
(2) Theoretically free of geometric distortion and convergence deviations.

1-3 Necessity of Pixel Replacement

It is not basically possible to change the horizontal and vertical amplitudes of the image because the LCD is assumed to be used with its pixels corresponding 1-to-1 to the video output pixels of a personal computer or other terminal.

If you want multi-scan and full-screen display at the same time, therefore, the video output pixels of a personal computer or other terminal must be converted into LCD pixels. This is called pixel conversion. (This conversion is generally called scaling processing.)

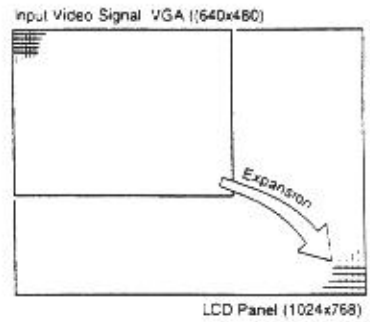


Fig. 4 Video Data Scan Image

1-4 Necessity of V.Fine Tuning (Clock)

A clock signal synchronized with video data is necessary to reproduce an image on the LCD panel. This clock must be completely identical with the video dot clock inside the personal computer. If the clock signal generated in the LCD is different from the video dot clock of the personal computer, the following problems will arise.

(1) Mach jitter
(2) Serious level of moire
(3) Screen amplitude too large or too small
(4) Image running out of shape (in case of large errors)

The personal computer does not output a signal having video dot clock information. Multi-scan, therefore, depends on the accuracy of the video dot clock from the synchronizing signal supplied by the personal computer. It is extremely difficult, however, to totally eliminate errors. (The synchronizing signal may have the same frequency, but the output timing of the video dot clock may be different.)

It is necessary, therefore, for the user to make a fine adjustment of the clock frequency.

This is the reason why the OSD menu has adjustment items on it.

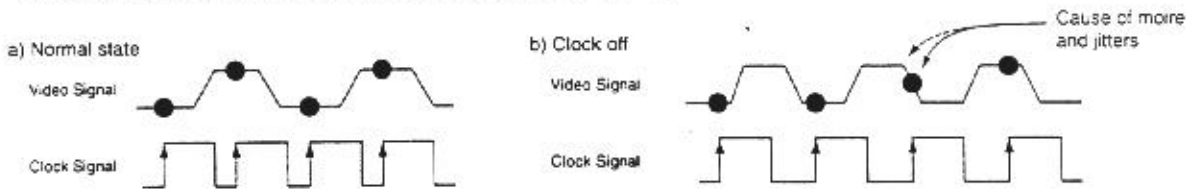


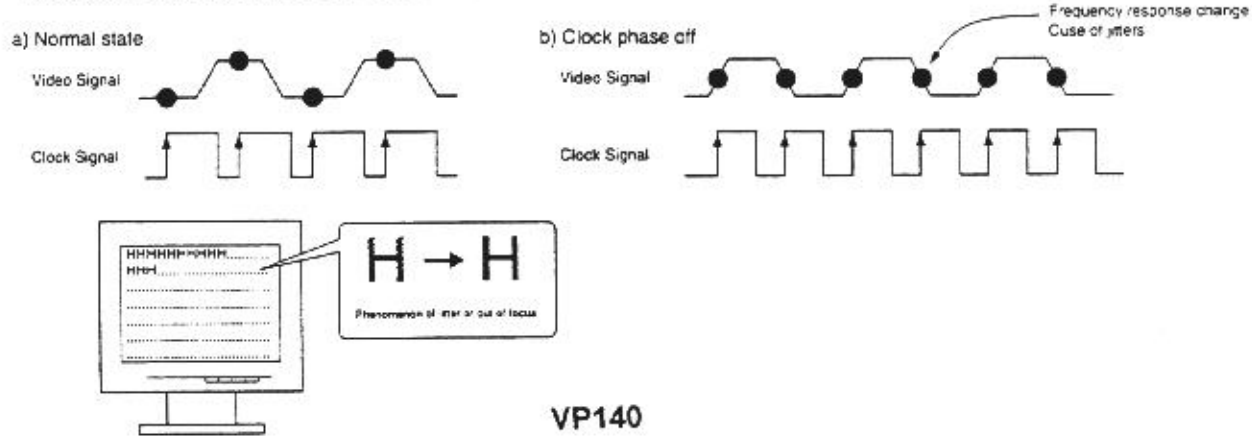
Fig. 5 V. Fine Tuning

1-5 Necessity of H.Fine Tuning (Phase)

As explained above, picture will be adversely affected if the video dot clock is not completely identical with the clock signal generated in the LCD.

The simple agreement of the frequencies as in V. fine tuning is not sufficient to assure satisfactory picture quality. Thus, it is necessary to also adjust the phases of the video dot clock and the clock signal of the LCD.

This adjustment is also made on the OSD menu.



2 General Description of The Main Hardware Components

2-1 The microcomputer block detects the horizontal and vertical frequencies of the synchronizing signal, and the polarity of the horizontal synchronizing signal and the polarity of the vertical synchronizing signal are input to the set, and controls the pixel conversion IC and other circuits according to the detected state of the synchronizing signals. Consisting mainly of the following, this block controls the multi-scan LCD.

2-2 Microcomputer

The microcomputer is the nucleus of the system.

It counts the horizontal and vertical frequencies of the synchronizing signals, switches on or off the microcomputer port according to the count, or set a value in the DAC or the pixel conversion IC to ensure proper analog circuit control and pixel conversion.

2-3 EEPROM

The EEPROM stores the data necessary for the microcomputer to perform various kinds of control.

The user's adjustment data is also stored here.

2-4 DAC

The DAC converts the digital signals from the microcomputer into analog voltages. It mainly controls the video system.

2-5 OSD

The OSD displays alphabetic characters and symbols in desired positions of the display area under microcomputer control.

2-6 Pixel Converter

The component adds pixels if they are short in case the original video size is different from the desired display size.

2-7 PLL (Phase-Locked Loop)

There are PLL1 and PLL2.

PLL1 takes the input signals in and PLL2 controls them for display on the LCD panel.

2-8 A/D Converter

The circuit converts analog input video signals into digital signals.

GENERAL INFORMATION

1.0 OUTLINE

VSLCD101 series are 14 inch (14.0" viewable) multi-scan color LCD(Liquid Crystal Display) monitor with the following nice features.
Original pixel conversion technology is newly introduced, which optimize the function.

2.0 FEATURES

2.1 LARGE SIZE TFT COLOR LCD

Large size TFT LCD(14" fully viewable screen) is corresponding to XGA(1024x768), and more viewable area than a traditional 15" CRT monitor.

2.2 MULTI SCAN & FULL SIZE DISPLAY

Original pixel converter LSI and 8 bit microprocessor control the circuit operation to meet the wide range of signals, and are able to display the full size of picture. So, VGA(640x480), SVGA(800x600) and XGA(1024x768) are applicable.

- For USA, Europe and other countries:fh=30~61kHz,fv=50~77Hz
- For Japan :fh=24~61kHz,fv=50~77Hz

2.3 COLOR LCD MONITOR WITH EQUIVALENT OF 16.19 MILLION COLORS

True color display(equivalent of 16.19 million colors)is realized by ERROR DISPERSION technology.

2.4 AUTO OPTIMIZING - PICTURE SIZE AND POSITION

Almost any timing will be tuned by **AUTO-SIZE** function for a comfortable size and position.

2.5 HIGH QUALITY IMAGE AT EXPANDED MODES

High quality image at expanded modes(VGA(640x480),SVGA(800x600),etc.) is realized by the original interpolation technology of pixel converter LSI.

2.6 POWER SAVING

Built-in Power Saving function based on **VESA-DPMS** standard.
Power energy shall be saved by controlling the circuit in accordance with power saving signals from a computer.

2.7 OSD (On Screen Display) FUNCTION

OSD (5 Languages) function is a new and excellent man-machine interface.
Anyone is able to set up the picture as he like through OSD menu.

2.8 SELF TEST FUNCTION

Self Testing picture comes out by pushing any key in the case of no-connection with a computer or power saving operation.
This function shows if the monitor is alive or not and can be used for self-aging tests.

2.9 ERGONOMIC DESIGN

Low emission design to meet MPR II & TCO'92

EMI design to meet FCC-B(fh:30~61kHz) and VCCI class2(fh:24~61kHz) without coating of Ni(nickel) or conductive paints that would be against the environmental protection.

2.10 17 FACTORY RESERVATIONS AND 16 USER MEMORIES

17 standard modes are reserved at the factory.
16 user memories are available to set the user's own timing and display information.

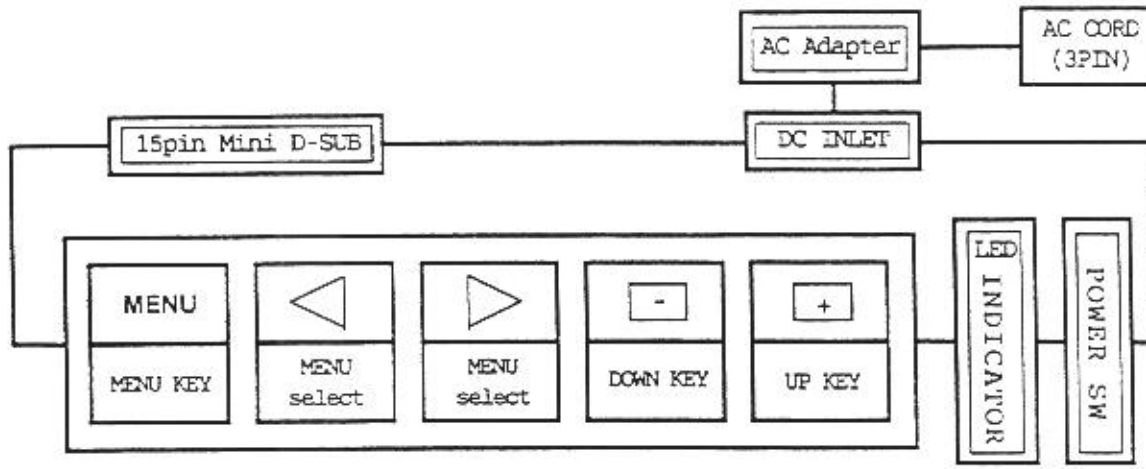
2.11 VESA DDC 1/2B

Compliant with VESA DDC(Display Data Channel) standard and applicable to DDC 1/2B uni-direction only.

2.12 NEW COMPACT CABINET

Narrow left and right side frames.

3.0 DIAGRAM



3.1 FRONT PANEL

POWER SW,LED, [MENU] Key(MENU), ◁ & ▷ Keys(direct control of Brightness, MENU select key in OSD menu) and [+] & [-] Keys(direct control of Contrast, up and down key to adjust the level of the functions in OSD menu) are located on the front panel.

* Monitor can be turned ON/OFF by keeping on pushing Power SW for a little time.

3.2 SIGNAL CONNECTOR AND DC INLET

Signal connector and DC inlet for AC Adapter are located on the back side of the cabinet.

3.3 OSD MENU FUNCTIONS

CONTRAST	BACKLIGHT	H.POSITION	V.FINETUNE(XGA only)
V.POSITION	H.FINETUNE(XGA only)	H.SIZE(except XGA)	V.SIZE(except XGA)
COLOR TEMP	VIDEO INPUT LEVEL	DISPLAY FREQUENCY	LANGUAGE
AUTO SIZE	RECALL		

* CONTRAST can be directly controlled with [+] / [-] Keys.
* BRIGHTNESS(brightness of black level) can be directly controlled with ◁ & ▷ Keys.
* BACKLIGHT in OSD menu can control the Brightness of back light of LCD.
* With sync signal, OSD menu appears by pushing [MENU] Key. Without sync signal, OSD window of self test appears by pushing any Key.
* With display image of 100% white field, AUTO SIZE can roughly adjust the image to the full size and the center position.
* If noise jitter appears at XGA (1024x768) mode, you can delete it by adjusting H.FINETUNE.

NOTE: By H.FINETUNE adjustment, there are more than two points to delete noise jitter. IF H.position is not at the center at one point, please set it to the another.

* If you want to keep the result of adjustment, please push the [MENU] key for memory, or keep the keys untouched for about 20 seconds, and it is automatically memorized.

NOTE : In case of RECALL, if you don't touched the key for about 30 seconds, RECALL function will be canceled.

4.0 MECHANICAL SPECIFICATIONS ····· Refer to the attached drawing

4.1 Dimension

Height : 354.5 mm ± 5mm
Width : 356 mm ± 5mm
Depth : 149 mm ± 5mm (at Tilt angle 0°)
208 mm ± 10mm (at Tilt angle 30°)

4.2 Weight

Net weight : 5.5 kg (Typical)
Packaged weight : 8.0 kg (Typical)

4.3 Viewable Display Area

284.2 mm x 213.1 mm

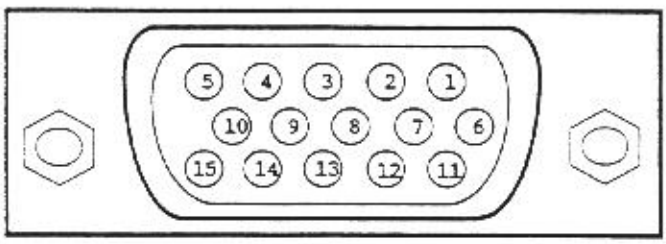
4.4 Tilt Angle

(0~ +30°) ± 2 °

5.0 CONNECTORS

5.1 Signal connector: Mini D-SUB 15P

< Mini D-SUB 15P Pin assignment >



1··· RED	6··· GROUND	11··· GROUND
2··· GREEN	7··· GROUND	12··· SDA(DDC)
3··· BLUE	8··· GROUND	13··· H.SYNC.
4··· GROUND	9··· NC	14··· V.SYNC.(V.CLK)
5··· NC	10··· GROUND	15··· SCL(DDC)

5.2 DC inlet

2P DC Power Jack(EIAJ RC-5320A Type)

- Voltage classification :5
- Type of construction :B

6.0 ELECTRICAL SPECIFICATIONS

6.1 STANDARD CONDITIONS ··· EXCEPT SPECIAL ITEMS

Display image	White, full "H" characters (7×9 dots) Video Signal : 100% duty Display area : 284.2 x 213.1mm
Video signal level	0.7 Vp-p
Contrast	75% point
Brightness	50% point
BACKLIGHT	Max.(100% point)
Ambient Temperature	20±5℃(68±9°F)
Input Voltage	AC 120V, 60Hz or AC 220V, 50Hz
Viewing direction	Right angle with surface of LCD
Size and Position	To be adjusted at full screen point by AUTO-SIZE function or manual control by OSD MENU.
H.FINETUNE	To be adjusted to the best point without noise jitter.
Measurements	After an initial warming-up time of more than 30 minutes.
Ambient light	Darkroom
Display mode	1024×768 MODE16(VESA Standard 60.02kHz, 75.03Hz)

6.2 POWER

6.2.1 POWER SUPPLY ··· Commercial power source

Input voltage	AC 90 - 132V, AC 198 - 264V
Power frequency	50Hz±3Hz, 60Hz±3Hz
Input current	1A max.(at 100-120V ac), 0.5A max. (at 220-240V ac)
Inrush current	30 A max.(at 100V ac),50 A max. (at 240V ac)
Power consumption	45W (typ.)

6.2.2 AC ADAPTER SPECIFICATIONS

Input voltage	AC 90 - 132V, AC 198 - 264V
Power frequency	50Hz±3Hz, 60Hz±3Hz
Output Voltage	DC 14.0V±5%
Output Current	DC 4.0A Max.
Length of DC cord	180cm ± 5cm
AC Inlet	CEE 22 Type
DC Power Plug	2P DC Power Plug(EIAJ RC-5320A Type) · Voltage classification :5 · Type of construction :B

6.2.3 Power Management for Power Saving

Power Saving system is designed based upon VESA DPMS Standard. (Version: 1.0)

1)Power consumption and recovery time

*1 APM State	SIGNALS			MONITOR POWER CONSUMPTION	RECOVERY TIME TO ON STATE	INDICATOR
	H. Sync	V. Sync	VIDEO			
ON	*3 NORMAL	*3 NORMAL	*2 ACTIVE	*4 100%	-----	Green
STAND-BY	No Sync or *5 <6kHz	>40Hz	*6 BLANK	<25W	<4s	Yellow
SUSPEND	>10kHz	No Sync or *5 <20Hz	*6 BLANK	<25W	<4s	Yellow
OFF	No Sync or *5 <6kHz	No Sync or *5 <20Hz	*6 BLANK	<8W	<20s	Yellow

The transition time from ON state to each APM state is 5 seconds minimum.

*1:APM : Advanced Power Management .
*2:Measurement Condition of power consumption for ON state :
DISPLAY IMAGE: WHITE full "H" characters(7×9 dots)
*3:NORMAL : see "7.4 ACCEPTABLE TIMING"
*4:Power consumption is measured at AC100-240V.
*5:Actual power saving operation is done at least less than specified values in the list.
*6:VIDEO BLANK : "BLANK" includes "no setup signal" and "no sync signal" on Video Signal.

6.3 STANDARD TIMING

Following 16 modes are reserved in the memory as standard timings at the factory. But the best adjustment conditions are different due to the characteristics of each video board in your Computer. Please re-adjust for your Computer.

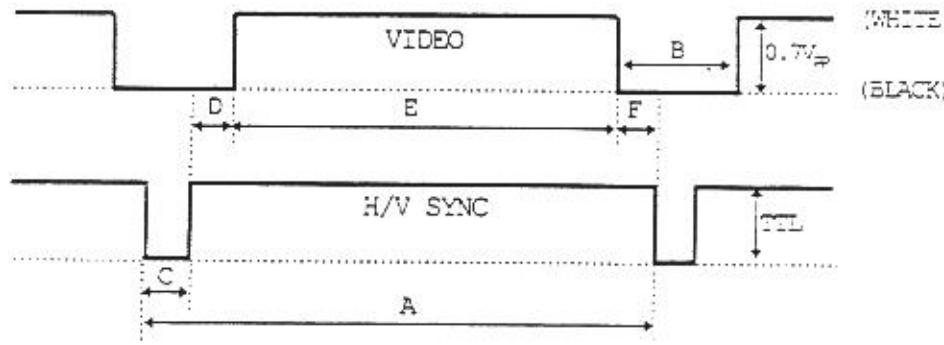
Fig-1 shows a definition of timing and signal level.

Electrical performance is specified based on 1024x768 mode unless otherwise mentioned.

Fig-1:TIMING CHART

< HORIZONTAL / VERTICAL >

A: Period
B: Blanking
C: Sync Width
D: Back Porch
E: Active
F: Front Porch



RESERVATION TIMING

		MODE 1	MODE 2	MODE 3	MODE 4
		PC-98(For Japan) 640x400 @56Hz	VGA350(Industry STD) 640x350 @70Hz	VGA480(Industry STD) 640×480 @60Hz	VGA400(Industry STD) 640x400 @70Hz
DOT CLOCK		21.050MHz	25.175MHz	25.175MHz	25.175MHz
HORIZ	fH	24.823kHz	31.468kHz	31.468kHz	31.468kHz
	A-Period	40.285 us(848 dots)	31.778 us(800 dots)	31.778 us(800 dots)	31.778 us(800 dots)
	B-Blanking	9.881 us(208 dots)	6.355 us(160 dots)	6.355 us(160 dots)	6.355 us(160 dots)
	C-Sync width	3.040 us(64 dots)	3.813 us(96 dots)	3.813 us(96 dots)	3.813 us(96 dots)
	D-Back porch	3.800 us(80 dots)	1.907 us(48 dots)	1.907 us(48 dots)	1.907 us(48 dots)
	E-Active	30.404 us(640 dots)	25.423 us(640 dots)	25.423 us(640 dots)	25.423 us(640 dots)
	F-Front porch	3.040 us(64 dots)	0.636 us(16 dots)	0.636 us(16 dots)	0.636 us(16 dots)
VERT	fV	56.416Hz	70.084Hz	59.939Hz	70.084Hz
	A-Period	17.725 ms(440 lines)	14.268 ms(449 lines)	16.684 ms(525 lines)	14.268 ms(449 lines)
	B-Blanking	1.611 ms(40 lines)	3.146 ms(99 lines)	1.430 ms(45 lines)	1.587 ms(49 lines)
	C-Sync width	0.322 ms(8 lines)	0.064 ms(2 lines)	0.064 ms(2 lines)	0.064 ms(2 lines)
	D-Back porch	1.007 ms(25 lines)	1.907 ms(60 lines)	1.049 ms(33 lines)	1.112 ms(35 lines)
	E-Active	16.114 ms(400 lines)	11.122 ms(350 lines)	15.254 ms(480 lines)	12.711 ms(400 lines)
	F-Front porch	0.282 ms(7 lines)	1.176 ms(37 lines)	0.318 ms(10 lines)	0.381 ms(12 lines)
Sync polarity (H/V)		Negative / Negative	Positive / Negative	Negative / Negative	Negative / Positive

Note: Because MODE 2 timing does not satisfy the 6.4 ACCEPTABLE TIMING(Tv1≧895), it is impossible to adjust to the full size or the center position.
The aspect ratio of MODE 1 and MODE 4 is not 4:3, but display image of these timings is expanded into the full size(Aspect Ratio 4:3).

RESERVATION TIMING

		MODE 5 VESA Standard 640×480 @72Hz	MODE 6 MAC 13 640×480 @67Hz	MODE 7 VESA Standard 640×480 @75Hz	MODE 8 VESA Standard 800×600 @56Hz
DOT CLOCK		31.500MHz	30.240MHz	31.500MHz	36.000MHz
HORIZ	fH	37.861kHz	35.001kHz	37.500kHz	35.156kHz
	A-Period	26.413 us(832 dots)	28.570 us(864 dots)	26.667 us(840 dots)	28.444 us(1024 dots)
	B-Blanking	6.096 us(192 dots)	7.407 us(224 dots)	6.350 us(200 dots)	6.222 us(224 dots)
	C-Sync width	1.270 us(40 dots)	2.083 us(63 dots)	2.032 us(64 dots)	2.000 us(72 dots)
	D-Back porch	4.063 us(128 dots)	3.241 us(98 dots)	3.810 us(120 dots)	3.556 us(128 dots)
	E-Active	20.317 us(640 dots)	21.163 us(640 dots)	20.317 us(640 dots)	22.222 us(800 dots)
	F-Front porch	0.762 us(24 dots)	2.083 us(63 dots)	0.508 us(16 dots)	0.667 us(24 dots)
VERT	fV	72.8088Hz	66.6689Hz	75.000Hz	56.250Hz
	A-Period	13.735 ms(520 lines)	15.000 ms(525 lines)	13.333 ms(500 lines)	17.778 ms(625 lines)
	B-Blanking	1.057 ms(40 lines)	1.286 ms(45 lines)	0.533 ms(20 lines)	0.711 ms(25 lines)
	C-Sync width	0.079 ms(3 lines)	0.086 ms(3 lines)	0.080 ms(3 lines)	0.057 ms(2 lines)
	D-Back porch	0.740 ms(28 lines)	1.114 ms(39 lines)	0.427 ms(16 lines)	0.626 ms(22 lines)
	E-Active	12.678 ms(480 lines)	13.714 ms(480 lines)	12.800 ms(480 lines)	17.067 ms(600 lines)
	F-Front porch	0.238 ms(9 lines)	0.086 ms(3 lines)	0.027 ms(1 lines)	0.028 ms(1 lines)
Sync polarity (H/V)		Negative / Negative	Negative / Negative	Negative / Negative	Positive / Positive

		MODE 9 VESA Proposal(SVGA) 800x600 @60Hz	MODE 10 VESA Proposal 800x600 @75Hz	MODE 11 VESA Proposal 800x600 @72Hz	MODE 12 MAC16 832x624 @75Hz
DOT CLOCK		40.0000MHz	49.5000MHz	50.0000MHz	57.2832MHz
HORIZ	fH	37.8788kHz	46.875kHz	48.0759kHz	49.7250kHz
	A-Period	26.400 us(1056 dots)	21.333 us(1056 dots)	20.800 us(1040 dots)	20.111 us(1152 dots)
	B-Blanking	6.400 us(256 dots)	5.171 us(256 dots)	4.800 us(240 dots)	5.587 us(320 dots)
	C-Sync width	3.200 us(128 dots)	1.616 us(80 dots)	2.400 us(120 dots)	1.117 us(64 dots)
	D-Back porch	2.200 us(88 dots)	3.232 us(160 dots)	1.280 us(64 dots)	3.910 us(224 dots)
	E-Active	20.000 us(800 dots)	16.162 us(800 dots)	16.000 us(800 dots)	14.524 us(832 dots)
	F-Front porch	1.000 us(40 dots)	0.323 us(16 dots)	1.120 us(56 dots)	0.559 us(32 dots)
VERT	fV	60.3165Hz	75.0000Hz	72.1876Hz	74.5502Hz
	A-Period	15.579 ms(628 lines)	13.333 ms(625 lines)	13.853 ms(665 lines)	13.414 ms(667 lines)
	B-Blanking	0.739 ms(28 lines)	0.533 ms(25 lines)	1.373 ms(66 lines)	0.865 ms(43 lines)
	C-Sync width	0.106 ms(4 lines)	0.064 ms(3 lines)	0.125 ms(6 lines)	0.060 ms(3 lines)
	D-Back porch	0.607 ms(23 lines)	0.448 ms(21 lines)	0.478 ms(23 lines)	0.784 ms(39 lines)
	E-Active	15.840 ms(600 lines)	12.800 ms(600 lines)	12.480 ms(600 lines)	12.549 ms(624 lines)
	F-Front porch	0.026 ms(1 lines)	0.021 ms(1 lines)	0.770 ms(37 lines)	0.020 ms(1 lines)
Sync polarity (H/V)		Positive / Positive	Positive / Positive	Positive / Positive	Negative / Negative

RESERVATION TIMING

		MODE 13 VESA Standard 1024x768 @60Hz	MODE 14 VESA Standard 1024×768 @70Hz	MODE 15 1024×768 @72Hz	MODE 16 VESA Standard 1024×768 @75Hz
DOT CLOCK		65.0000MHz	75.0000MHz	75.0000MHz	78.7500MHz
HORIZ	fH	48.3631kHz	56.4759kHz	57.8701kHz	60.0229kHz
	A-Period	20.677 us(1344 dots)	17.707 us(1328 dots)	17.280 us(1296 cots)	16.660 us(1312 dots)
	B-Blanking	4.923 us(320 dots)	4.054 us(304 dots)	3.627 us(272 cots)	3.657 us(288 dots)
	C-Sync width	2.092 us(136 dots)	1.813 us(136 dots)	1.920 us(144 cots)	1.219 us(96 dots)
	D-Back porch	2.462 us(160 cots)	1.920 us(144 dots)	1.387 us(104 dots)	2.235 us(176 dots)
	E-Active	15.754 us(1024 cots)	13.653 us(1024 dots)	13.653 us(1024 dots)	13.003 us(1024 cots)
	F-Front porch	0.369 us(24 dots)	0.320 us(24 dots)	0.320 us(24 dots)	0.203 us(16 cots)
VERT	fV	60.0038Hz	70.0694Hz	71.7978Hz	75.0285Hz
	A-Period	16.666 ms(806 lines)	14.272 ms(806 lines)	13.928 ms(806 lines)	13.328 ms(800 lines)
	B-Blanking	0.786 ms(38 lines)	0.673 ms(38 lines)	0.657 ms(38 lines)	0.533 ms(32 lines)
	C-Sync width	0.124 ms(6 lines)	0.106 ms(6 lines)	0.104 ms(6 lines)	0.050 ms(3 lines)
	D-Back porch	0.600 ms(29 lines)	0.513 ms(29 lines)	0.501 ms(29 lines)	0.466 ms(28 lines)
	E-Active	15.880 ms(768 lines)	13.599 ms(768 lines)	13.271 ms(768 lines)	12.795 ms(768 lines)
	F-Front porch	0.052 ms(3 lines)	0.053 ms(3 lines)	0.052 ms(3 lines)	0.017 ms(1 lines)
Sync polarity (H/V)		Negative / Negative	Negative / Negative	Negative / Negative	Positive / Positive

		MODE 17 MAC 19 1024x768 @75Hz
DOT CLOCK		80.0000MHz
HORIZ	fH	50.241kHz
	A-Period	16.600 us(1328 dots)
	B-Blanking	3.800 us(304 cots)
	C-Sync width	1.200 us(96 cots)
	D-Back porch	2.200 us(176 cots)
	E-Active	12.800 us(1024 cots)
	F-Front porch	0.400 us(32 cots)
VERT	fV	74.927Hz
	A-Period	13.346 ms(804 lines)
	B-Blanking	0.597 ms(36 lines)
	C-Sync width	0.049 ms(3 lines)
	D-Back porch	0.498 ms(30 lines)
	E-Active	12.749 ms(768 lines)
	F-Front porch	0.049 ms(3 lines)
Sync polarity (H/V)		Negative / Negative

6.4 ACCEPTABLE TIMING

If your timing is within following specifications, this LCD monitor can automatically function with a full size and best position.

Pixel Clock(fd): ≦80MHz

NOTE: If pixel clock(fd) is over 80MHz,because of A/D converter's limitation, you can not adjust the image to full size.

Horizontal

1)Sync frequency:

- For USA, Europe and other countries : 30.0 ~ 61.0 kHz
- For Japan : 24.0 ~ 61.0 kHz

2)Dots of Horizontal Period: To be an even number.(XGA:1024×768 only)

3)Dots of Active Video Time: 640 ~ 832 dots (except XGA:1024×768)

4)Th1 *1: 1050 ~ 1590

5)Back Porch ≧ 1.2 μs

6)Sync Width ≧ 1.1 μs

Vertical

1)Sync frequency: 50.0 ~ 77.0 Hz

2)Tv1 *2: 778 ~ 895

3)Front Porch + Sync Width ≧ 3 Lines

4)Back Porch ≧ 3 Lines

5)Sync Width ≧ 0.045 ms

6)Active Lines: 350,400,480,600,624 and 768 lines are supported.

*1:Th1=(V.active Line)÷(fH)×(65MHz÷768)

*2:Tv1=(V.period Line)÷(V.active Line)×768

NOTE: Interlaced scanning Timing is not supported.

Aspect Ratio: 4:3 aspect ratio.

NOTE: Even if the aspect ratio of your timing is not 4:3, display image will be expanded into the full size(Aspect Ratio 4:3).

Please notice, however, that there is a case you can not get the size and/or position you want.(for example, display video time is too short, you can't get a bigger size of the image.)

The new input signal must have a frequency difference greater than that shown in the table below from input signals that already stored.

Horizontal frequency	Vertical frequency
24kHz ± 1kHz to 61kHz ± 4kHz	50Hz ± 0.3Hz to 77Hz ± 1.2Hz

6.5 SIGNAL LEVEL AND INPUT IMPEDANCE

6.5.1 Video Signal level

This LCD monitor is adjusted at the factory using $0.7V_{p-p}$ video signal with the black level 0V.

This LCD display is compatible with 1.0Vpp video signal by using the video input level selection.

6.5.2 Sync Signal level

Sync Signal level: TTL level(H/V Separate only)

6.5.3 Input Impedance

Video input: 75 Ω

Sync input ≧ 1k Ω

6.6 DISPLAY PERFORMANCE

6.6.1 Display area

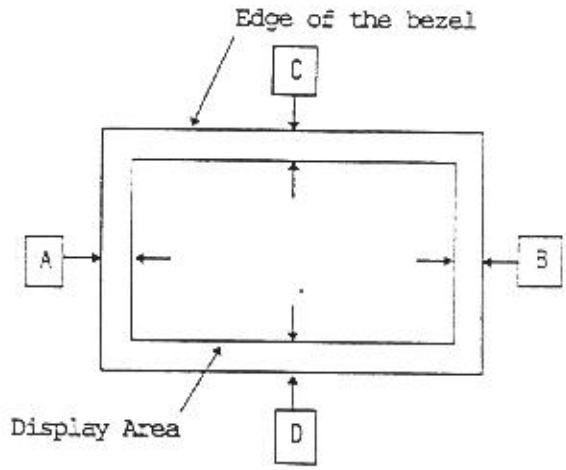
Width : 284.2 mm

Height: 213.1 mm

6.6.2 Centering

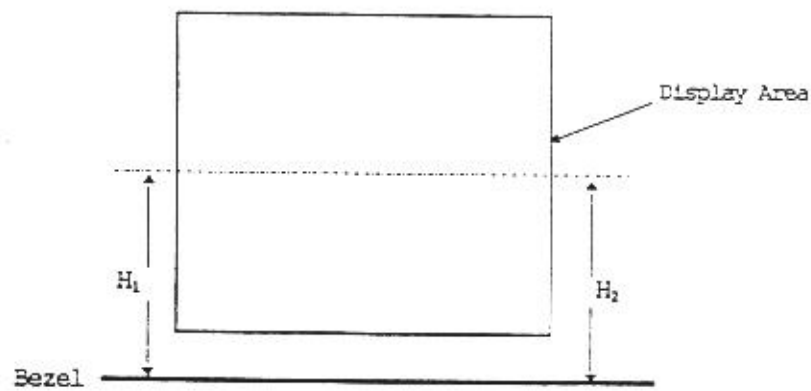
$|A - B| \leqq 2$ mm

$|C - D| \leqq 2$ mm



6.6.3 Rotation

$|H_1 - H_2| \leqq 2$ mm



6.7 GENERAL PERFORMANCE

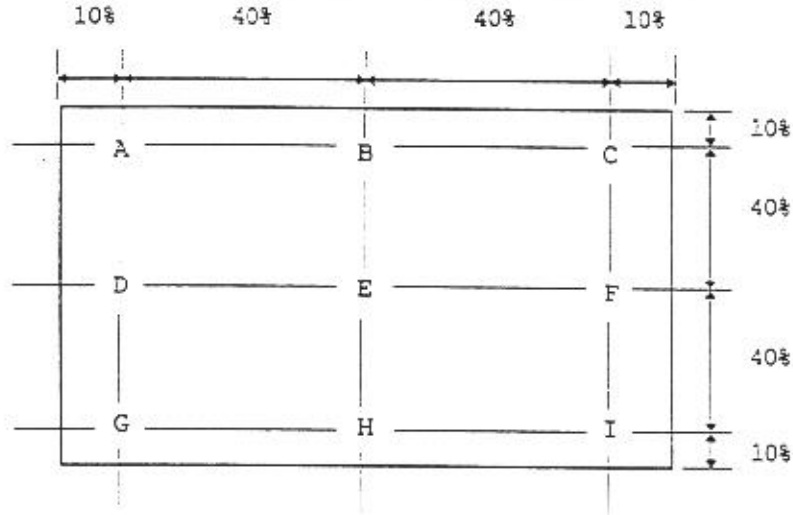
6.7.1 Maximum Pixel Clock: 80MHz

6.7.2 Maximum luminance

Value	180 cd/m² (typ.)for 100% white field at the center of the display area.
Conditions	Display image : White full flat field Luminance : STD. (Contrast : Max.(100% point)) (Brightness : 50% point) (BACKLIGHT : Max.(100% point))

6.7.3 Brightness variation

Value	150% (Max.) Variation = MAX/ MIN x 100
Conditions	Display image : White full flat field Luminance : STD. (Contrast : Max.(100% point)) (Brightness : 50% point) (BACKLIGHT : Max.(100% point)) MAX : Luminance at A~I position of maximum brightness MIN : Luminance at A~I position of minimum brightness



6.7.4 Color Point

Value	x = 0.315 ± 0.050 y = 0.345 ± 0.050
Conditions	Display image : White full flat field at the center of the display area. Luminance : STD. (Contrast : Max.(100% point)) (Brightness : 50% point) (BACKLIGHT : Max.(100% point))

NOTE: Luminance and color point shall be measured by the following system:
Measuring Equipment: TOPCON BM-5A, MINOLTA CA-110 or equivalent
Measuring Field: 2°
Angle: H= 0° / V= 0°
Distance: 500 mm from LCD surface(BM-5A)
210 mm from LCD surface(CA-110)

6.7.5 Jitter

Invisible at a distance of 60cm from LCD surface.

7.0 ENVIRONMENT

7.1 AMBIENT TEMPERATURE AND HUMIDITY

LCD MONITOR	Operating	Storage and shipment
Temperature(Ta)	0 ~ 35 ℃	-20 ~ +60 ℃
Humidity	5~90%RH(non-condensation)	5~90%RH(non-condensation)

NOTE: Humidity of storage and shipment

Ta ≦ 40℃ Humidity shall be less than 90%RH.

Ta > 40℃ Absolute humidity shall be lower than moisture of the 90% at 40℃.

AC ADAPTER	Operating	Storage and shipment
Temperature(Ta)	0 ~ 35 ℃	-10 ~ +60 ℃
Humidity	5~85%RH(non-condensation)	1~90%RH(non-condensation)

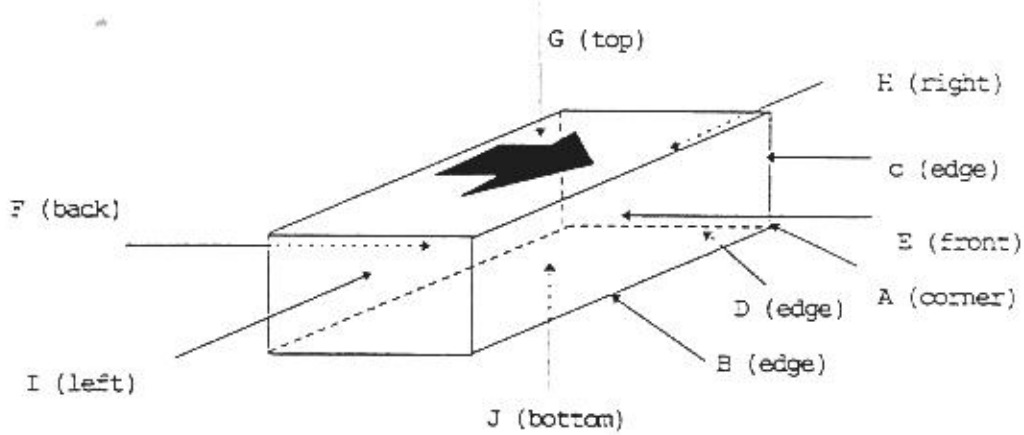
7.2 VIBRATION AND SHOCK

7.2.1 Vibration

	Order of tests	Direction of vibration		Acceleration: Non-Operation	Acceleration: Storage and shipment	Frequency	Sweep	Test time
Unpacked	1	Vertical	Up to down	2.9m/s² (0.3G)		5 - 55 Hz	120 s	30 min
	2	Horizontal	Front to back					15 min
	3		Right to left					
Packed (No Hold)	1	Vertical	Up to down		1.0Grms	5 - 250 Hz	Random	60 min
	2	Horizontal	Front to back					60 min
	3		Right to left					60 min

7.2.2 Shock (Drop test)

Unpacked	We are studying now.			
Packed	Order of drop	Face to drop is to face the floor. (see the figure)	Height	Number of drop
	1	A, B, C, D, E, F, G, H, I, J	76.2 cm	1 time for each



8.0 LCD SPECIFICATIONS

8.1 GENERAL SPECIFICATIONS

Part No.		EDTCF01QDF,36cm Color TFT LCD Module
Type		14 inch(14.0 inch viewable)
Drive system		a-Si TFT Active Matrix Type
Pixel Arrangement		RGB vertical stripe
Display Mode		Normally White
Dimension of Outline		330(W) x 243.5(H) x 16max(D)mm
Effective Display Area		H:284.2mm x V:213.1mm
Resolution		XGA(1024x768)
Number of Pixels		H:1024 x V:768 pixels
Number of dots		H:3072 x V:768 dots
Pixel Pitch		H:0.2775 x V:0.2775 mm
Contrast Ratio		120:1(typical),80:1 (Min.)
Face Coating		Anti-glare Hard Coating Type
Number of Color		262,144 colors
Viewing Angle Range		V:+60° /−25° ,H:±45° (typical) V:+40° /−15° ,H:±30° (Min.)
Response Time		ton:15ms ,toff:36ms (typical) ton:23ms ,toff:54ms (Max.)
Back Light		Edge light Type(Cold cathode type)
Life time of Back Light		10,000 hours(Min.) *
Color Position on CIE	White	X=0.315±0.050 Y=0.345±0.050

Note: The TFT color LCD contains cold cathode fluorescent lamps. Please follow local ordinances or regulations for its disposal.

*The luminance of Back Light will become to a half of initial luminance.

8.2 SPECIFICATIONS OF SCREEN DEFECTS

8.2.1 Standard Conditions

Environment: Darkroom, 25±5°C, 40-70%RH
Screen Size: 284.2 mm x 213.1 mm

8.2.2 Defects of Lines

Not Visible

8.2.3 Defects of Points(Pixel and Dot)

Total defects points are less than 50 PPM.

Defects Item	Size of defect UNIT:P(Pixel)	Max. permissible number	Max. permissible distance	
Bright point	1/3 P≦Size<2/3 P	15	-----	
	2/3 P≦Size<1 P	8	-----	*3
	Size≧1 P	none	-----	
	nearest pitch	-----	10 mm	
	Total number	15	-----	
Dark point	1/3 P≦Size<1 P	17	-----	*4
	Size≧1 P	none	-----	
	nearest pitch	-----	5 mm	

*1 1Pixel = 3dots of RGB
*2 In case of 2 adjacent defects are bigger than 1 dot(1/3 pixel), if the distance of 2 adjacent defects is longer than Max. permissible distance, then these 2 defects are counted as another defects.
*3 The defects of green bright point should not be adjacent to each other.
*4 R,G and B dark points are less than 6 each.

In case of a defect is smaller than 1 dot(1/3 pixel), the defect is not counted as "defect of point".

9.0 REGULATORY STANDARDS

9.1 SAFETY STANDARDS

Applicable standards

- UL1950; Listing
- CSA 22.2 No.950; Certification
- TUV(EN60950, IEC950)/ GS(ZH1)
- NORDIC(SEMKO, NEMKO, DEMKO, FIMKO)

9.2 EMC STANDARDS

Applicable standards

For Japan(fh:24~61kHz)

- VCCI class 2

For USA, Europe and other countries(fh:30~61kHz)

- FCC part 15, Subpart B, class B
- IC(DOC) class B
- CISPR 22 class B (EN55022)
- CE Marking

< EMI test pattern >

White, full " H " characters (9×14 dots), block (12×24 dots)

10.0 OTHERS

Applicable programs

- MPR Ⅱ Radiation
- TCO'92 Radiation
- ENERGY STAR
- ISO9241-3 (Ergonomics)

11.0 AC ADAPTER & POWER CORD

- UL/CSA/TUV/SEMKO/DENTORI approved AC adapter(Length of DC cord is 1.8m)
- UL/CSA approved 3pin power cord (Wall Type) --- VSLCD101-1M
- VDE approved 3pin power cord (PC Type) -------- VSLCD101-1E

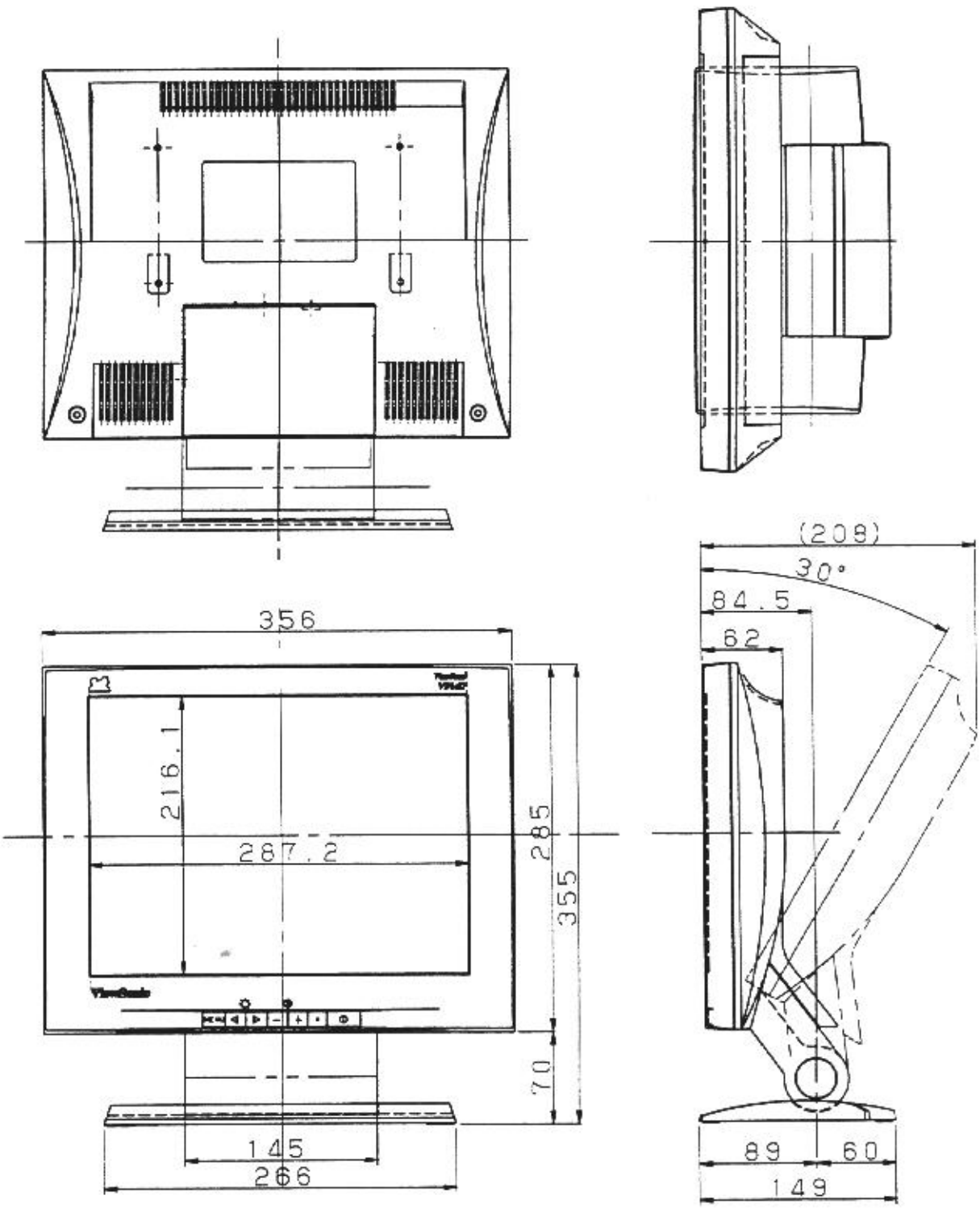
12.0 SIGNAL CABLE

Signal cable with 15pin D-SUB connectors at both ends.
Length : 1.8 meters (5.91 feet)

13.0 RELIABILITY

>30,000H (Demonstrated MTBF without Back Light)

DIMENSIONS



VP140

DISASSEMBLY INSTRUCTIONS

1. Tilt Base removal

Note: Spread a mat underneath to avoid damaging the LCD surface.

- See figure ① (a)).

2. Rear Cover and Cable Cover

- See figure ① (b)) and ②.

3. Main P.C.B shield removal

- See figure ③ (a), b) and c)).

4. Main P.C.B Block removal and Disconnect connectors.

- See figure ③ (d)) and ④ (a))
- See figure ④ (b)) and ⑤ (a), b)).

To remove the flexible P.C.B, bring a minus screwdriver (small) to the stopper portion, push the stoppers in the direction of an arrow, and then extract the flexible P.C.B.

Note: Do not bend or damage the flexible P.C.B when handling it. To mount this P.C.B, insert the connection terminal section of the flexible P.C.B fully in and secure the stoppers firmly.

5. Inverter P.C.B removal

- See figure ④ (c), d))

6. Front P.C.B removal

- See figure ④ (e)).

7. LCD Panel removal

- See figure ⑥, ⑦.

8. Fluorescent Lamp removal

- See figure ⑧.

Note: When replacing, the Fluorescent lamps with combination of upper and lower ones.

Reason: Fluorescent lamps are consumable. As they are used, their brightness is gradually deteriorated. Two fluorescent lamps are used at the top and bottom of the LCD screen. If only one lamp is replaced on either side, there can be unevenness in the brightness. Therefore, a set of both upper and lower fluorescent lamps should be replaced in all cases.

No single lamp unit is supplemented, and a set of upper and lower fluorescent lamps is always supplied.

Fig. ①

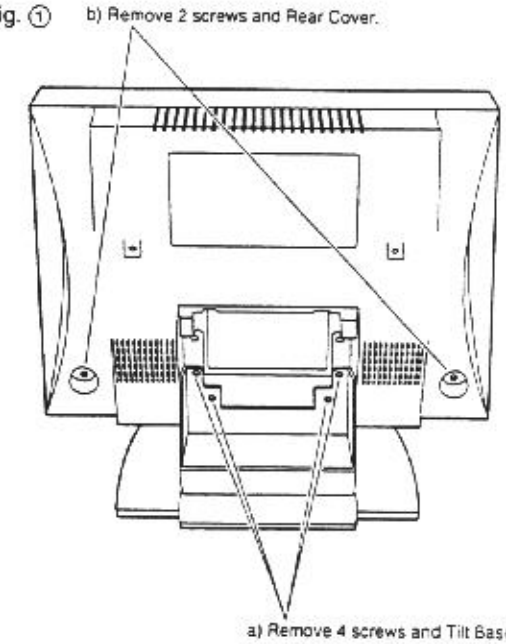


Fig. ②

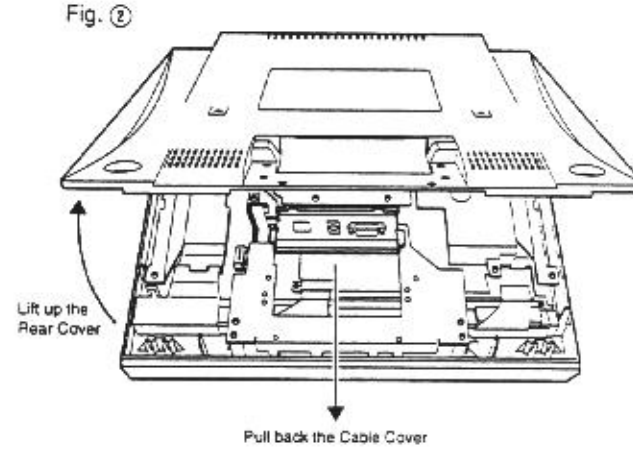


Fig. ③

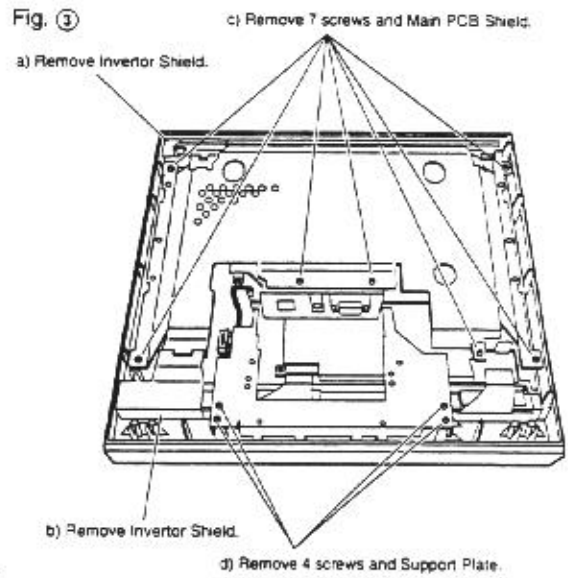

c) Remove 7 screws and Main PCB Shield.
a) Remove Invertor Shield.
b) Remove Invertor Shield.
d) Remove 4 screws and Support Plate.

Fig. ④

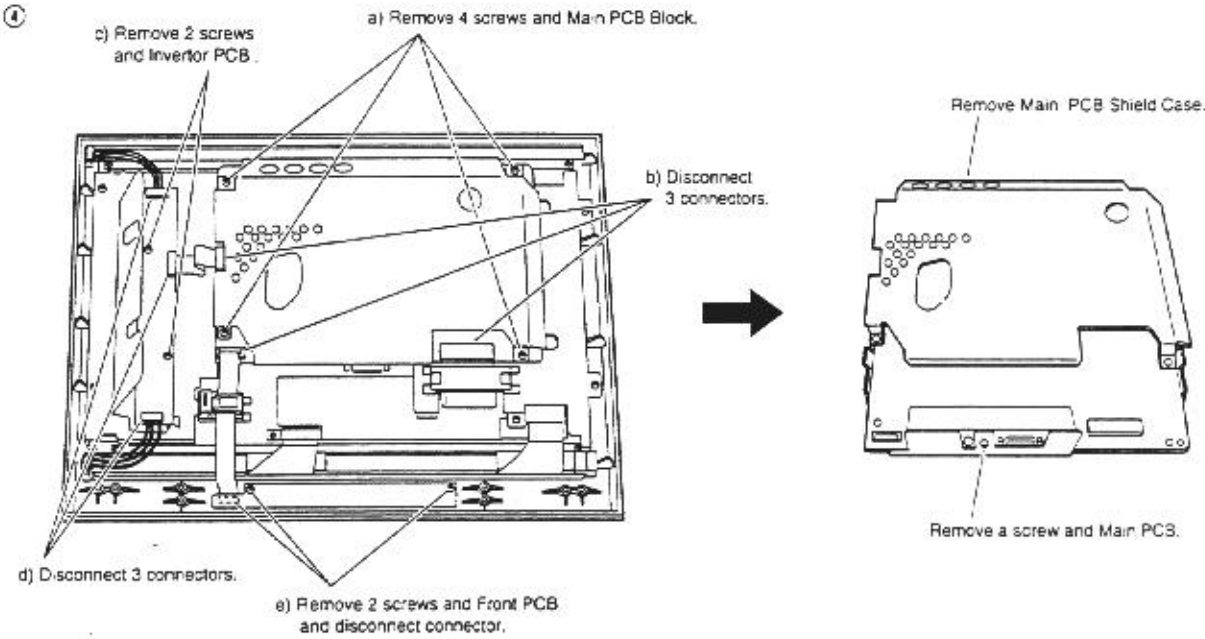

c) Remove 2 screws and Invertor PCB.
a) Remove 4 screws and Main PCB Block.
b) Disconnect 3 connectors.
Remove Main PCB Shield Case.
Remove a screw and Main PCB.
d) Disconnect 3 connectors.
e) Remove 2 screws and Front PCB and disconnect connector.

Fig. ⑤

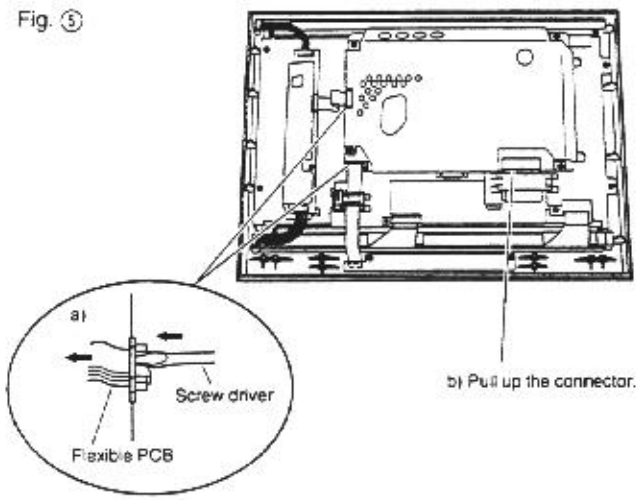


Fig. ⑤

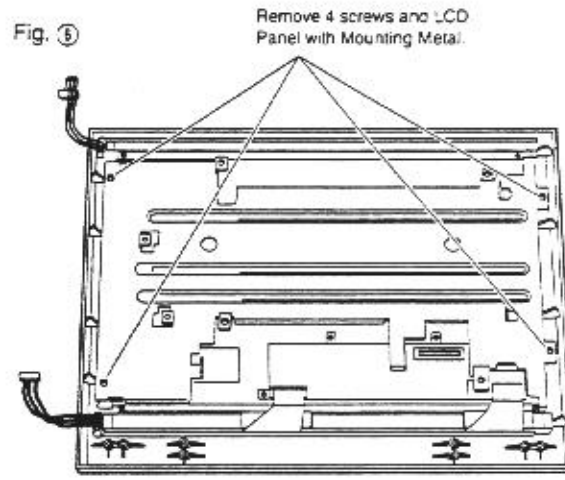


Fig. ⑦

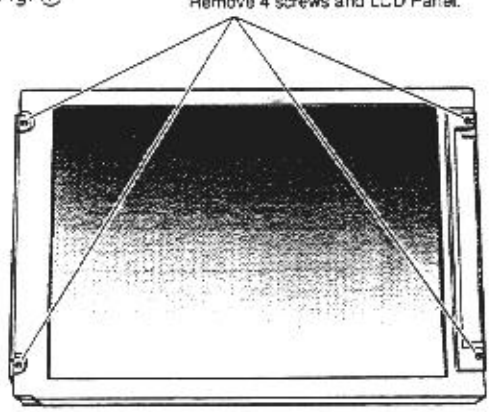
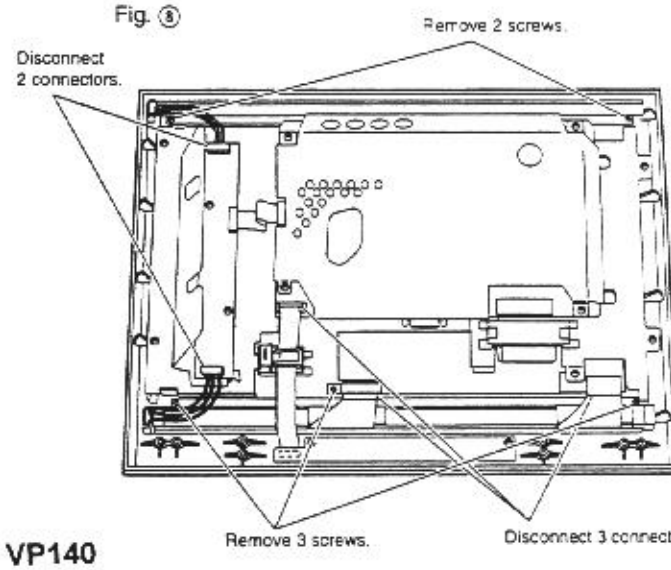
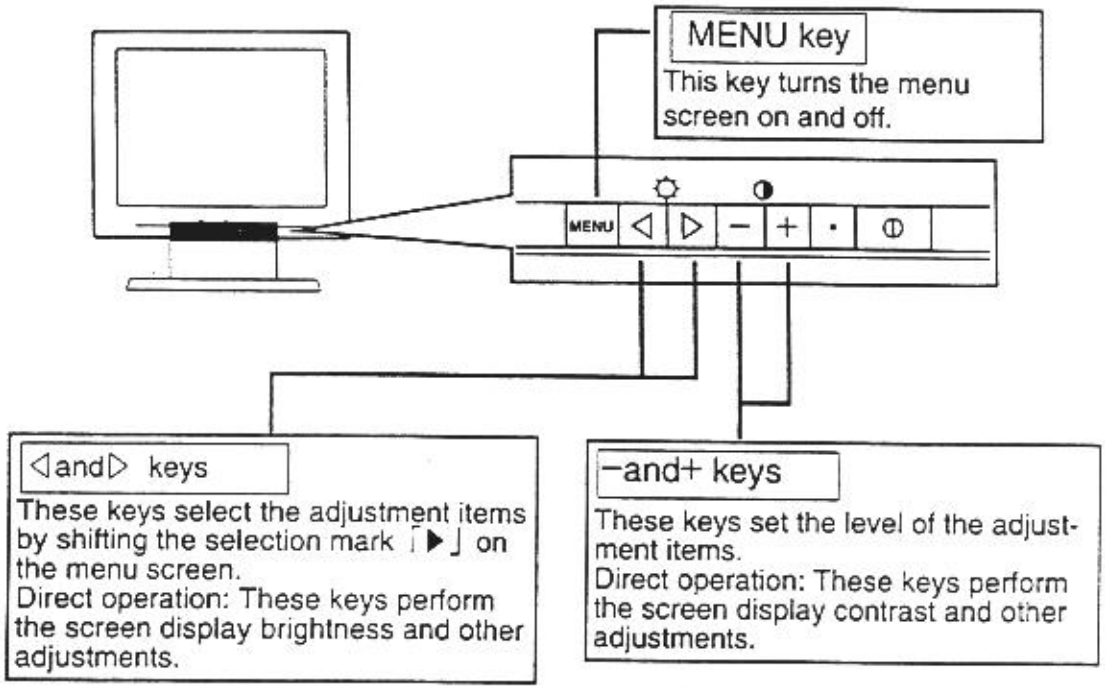


Fig. ⑧

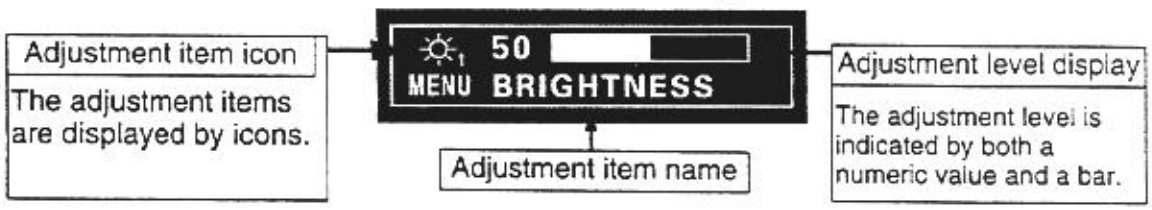


CONTROL LOCATION


MENU key
This key turns the menu screen on and off.
MENU
◁and▷ keys
These keys select the adjustment items by shifting the selection mark [▶] on the menu screen.
Direct operation: These keys perform the screen display brightness and other adjustments.
−and+ keys
These keys set the level of the adjustment items.
Direct operation: These keys perform the screen display contrast and other adjustments.

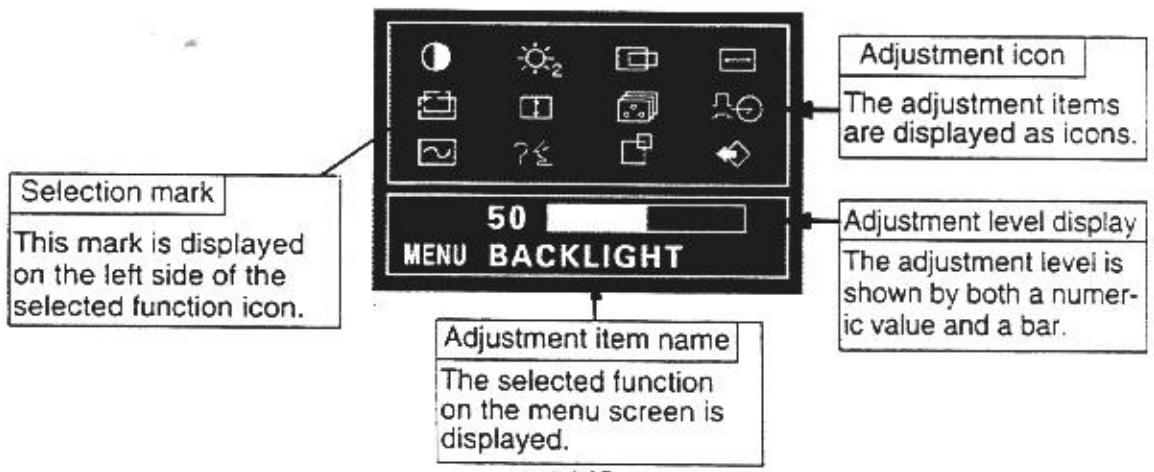
Direct Screen

There are two adjustments, contrast and brightness on the direct screen.


Adjustment item icon
The adjustment items are displayed by icons.
50
MENU BRIGHTNESS
Adjustment item name
Adjustment level display
The adjustment level is indicated by both a numeric value and a bar.

Menu Screen (When the resolution is set from 640x400 to 832x624.)

The menu screen displays icons for the adjustment items of this unit.
However, brightness level 1 cannot be adjusted on the menu screen.

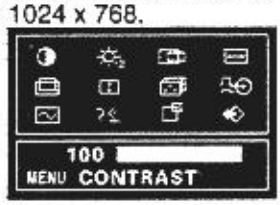

Adjustment icon
The adjustment items are displayed as icons.
Selection mark
This mark is displayed on the left side of the selected function icon.
50
MENU BACKLIGHT
Adjustment level display
The adjustment level is shown by both a numeric value and a bar.
Adjustment item name
The selected function on the menu screen is displayed.

The menu screen is displayed by the MENU key.
The adjustment items of this unit are displayed as icons.
Each icon indicates an adjustment item shown in the figure.

When the resolution is
640 x 400 to 832 x 624.

CONTRAST BACKLIGHT H. POSITION H. SIZE
V. POSITION V. SIZE COLOR TEMP. VIDEO LEVEL
DISP. FREQ. LANGUAGE AUTO SIZE RECALL

When the resolution is
1024 x 768.



CONTRAST BACKLIGHT H. POSITION V. FINETUNE
V.POSITION H.FINETUNE COLOR TEMP. VIDEO LEVEL
DISP. FREQ. LANGUAGE AUTO SIZE RECALL

◑ CONTRAST

Direct operation: Even if the menu screen does not appear, the contrast can be adjusted by pressing the "-" or "+" keys.

Adjust the screen contrast.
(Standard level = 75)
Press the MENU key to register the setting value.

The "-" key decreases the contrast of the image.

The + key increases the contrast of the image.

☼₁ BRIGHTNESS (black level)

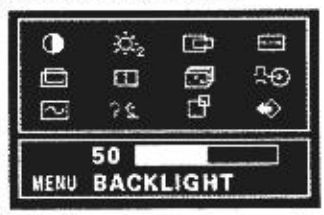
Direct operation: Even if the menu screen does not appear, the contrast can be adjusted by pressing the "◁" or "▷" keys. Press the MENU key to register the setting value.

Adjust the brightness
(low gradation part: black level).
(Standard level = 50)

The "◁" key decreases the brightness of the image.

The "▷" key increases the brightness of the image.

☼₂ BACKLIGHT



(When the resolution is 640 x 400 to 832 x 624.)

Adjust the brightness of the backlight.

The "-" key decreases the brightness of the backlight.

The "+" key increases the brightness of the backlight.

ADJUSTMENT AND CHECK PROCEDURE

INTRODUCTION

- This monitor is controlled by a microcomputer. With all is digitally adjusted.
  Therefore a computer, the dedicated control software, the dedicated interface, a 9~12 V power supply, and a signal generator are required servicing.

TOOLS REQUIRED

- **Computer**
  The control software is IBM PC compatible only. Therefore, it is not compatible with any other operating systems. For further information please contact our sales office.

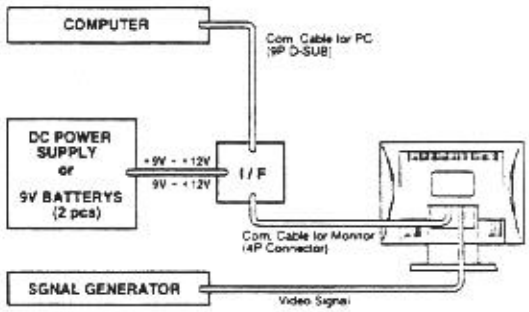
- **Control Software**
  The **VP140**chassis can only use "VSLCD101 adjustment program disk". No other program can access the EEPROM on the monitor. For further information please contact our sales office.

- **Interface**
  The interface is dedicated to work only with the control software and the our chassis. There are no substitutes for this interface. For further information please contact our sales office.

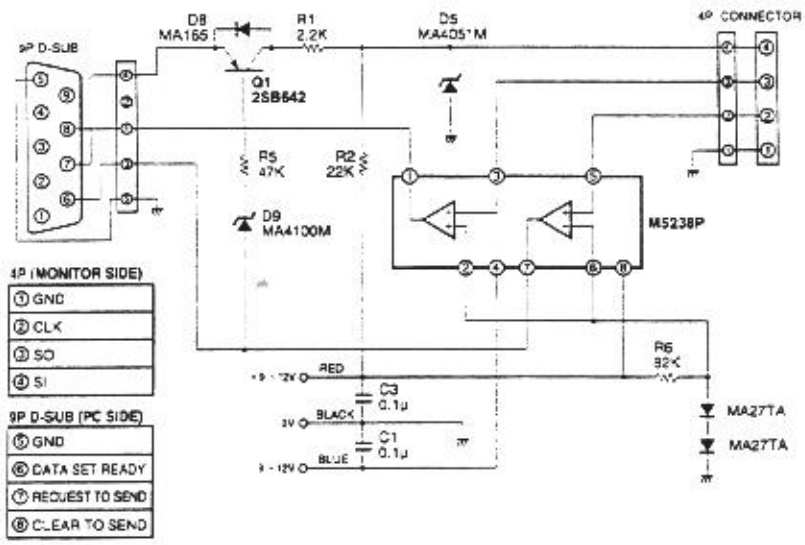
- **Power Supply**
  A DC 9~12 V (+9~12 V/-9~12 V) power supply is required for operating the interface.

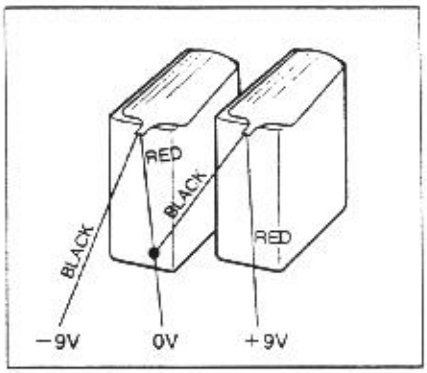
- **Signal Generator**
  It is necessary for you to use a signal generator which operates on fH 65 kHz, fv 80 Hz, and fc 50 MHz bands.

INTERFACE CONNECTION



INTERFACE SCHEMATIC DIAGRAM





BATTERY CONNECTION

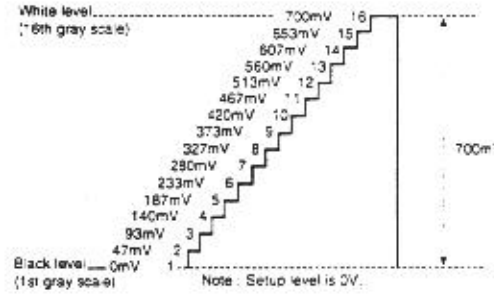
OTHER TOOLS

- Oscilloscope (dual trace)
- Scope probe – Attenuation: 100:1
  Attenuation: 10:1
- Digital Voltmeter – Range: 0 to 1000 V DC
  Accuracy: 0.1 %
- TV color Analyzer II – that reads luminance and chromaticity X and Y coordinates.
- AC power supply – Output voltage : 0 to 300 V
- Microscope – Scale factor: 50

STANDARD CONDITION OF ADJUSTMENT PROCEDURE

- Signal timing : Standard timing 1024 x 768 (75 Hz)
- Display pattern : White, full "H" character
- Signal level : V/H: TTL level video: 700 mV
- Input voltage : AC 120 V, 60 Hz or AC 220 V, 50 Hz
- Ambient temperature : Room temperature
- Warm-up time : More than 30 minutes
- Brightness control : 50% point
- Contrast control : 75% point
- Signal cable : Attached

Video input signal from PC.



ADJUSTMENT SOFTWARE

1. Software operating procedure

A) Power on the computer.
B) Connect the Communication cable for monitor adjustment.
C) Insert the adjustment disk into the drive.
D) At the A:> prompt type "VSR", then press [ENTER].
E) Refer to the adjustment procedures.

A function to identify the connected monitor is provided to prevent accidents due to erroneous use of **VP140** chassis program. If this program is used for any monitor other than **VP140** the message reading "This monitor is not a **VP140** chassis. All further activity has been prevented" is displayed and the operation is stopped.

2. Adjustment Program

- This adjust program uses different menus for main PCB replacement and repairs to facilitate adjustments. Select an item or items according to work requirements.
- No adjustment is necessary after replacing parts other than those of the main PCB.
- The adjustment procedures to be followed after making repairs on the main PCB are described in the STEP-2 Service Manual.

Main Menu of Adjustment Program

```
VP140 ADJUST MAIN MENU >>  ( e: exit )  <Ver 7.9>
   1:  Initial Check
   2:  Main-PCB Replaced
   3:  Main-PCB Repaired
Which data do you wanna change ( 1 - 3 , e:exit ) ? ->
```

1: Initial Check
Check if monitor whether it is **VP140** chassis.

2: Main-PCB Replaced
This is a service menu to be used when the main PCB is replaced.

3: Main-PCB Repaired
This is a service menu to be used when repairs are made on the main PCB.

3. Adjustment Incidental to Main PCB Replacement

- When the main PCB has been replaced, no special adjustment is necessary except for setting control flags (Final Tune).

Note :Be sure to set control flags (Final Tune) on the main PCB supplied for service purposes.

1) Description of the Menus
(1) Enter "VSR" in the state of A:> and press the [ENTER] key, then the Main Menu shown at right appears. (Fig. 1)
(2) Select 2: "Main-PCB Replaced" because this item is for main PCB replacement. Then, the menu shown at right appears. (Fig. 2)

Fig. 1

```
VP140 ADJUST MAIN MENU >>  ( e: exit )  <Ver 7.9>
   1:  Initial Check
   2:  Main-PCB Replaced
   3:  Main-PCB Repaired
Which data do you wanna change ( 1 - 3 , e:exit ) ? ->
```

Fig. 2

```
VP140 MAIN-PCB REPLACED MENU>>  ( e: exit )  <Ver 7.9>
   1: Load data from FILE        4: Clear User preset
   2: Final Tune                 5: Information Service !
   3: Save data to FILE
```

(3) Description of each menu

1: **Load Data from File**
This transfers the data file from the disk to the EEPROM on the monitor

2: Final Tune
To prevent operation errors in changes of various type of control flags, these flags are automatically returned to the default settings.

3: **Save Data to File**
Transfers the data from the EEPROM on the monitor to a data file on a floppy disk or hard drive. The data file can be named anything as long as it is less than 8 characters long.

4: **Clear User Preset**
Clear the data written in the user preset domain. There is no data in the user presets when the product shipped from the factory.

5: **Information Service**
Displays the H/V frequencies that is being supplied to the monitor and gives the operational status of the monitor.

ADJUSTMENT PROCEDURE

1. Description of Adjustment Method

Main PCB Replacement : Se ect the 2 Change Main PCB

	Program Menu Item	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
A	2 Final Tune		A1		Set the cell to the program menu item at left and press [↵].	
			A2		The following message starts tuning start ! < loading EEPROM data > wait a moment... ....end < saving data to EEPROM > wait a moment... ....end Erase All 'User Preset DATA'. Okay? (y/n)	
			A3		Press [Y] or [N] and [↵]. Select [Y] unless otherwise instructed by the customer finish !! < SET FLAG > wait a moment... end tune end. Hit return key !	
			A4		Press [↵] and [E] to return to the main menu.	
	The following are supplementary items for servicing					
B	3 Save data to FILE		B1		Set the cell to the program menu item at left and press [↵].	
			B2		Key in the file name after [ ]. Use serial number as a file name. (Example : FF5110001 = "F5110001.DAT")	
C	STANDARD DATA SETTING 1: Lode data from FILE		C1		Set the cell to the program menu item at left and press [↵]. A message FILE -> EEPROM FILE NAME (q or Q:escape) [ ]: is displayed. So type in "DACDATA.DAT" (when using the standard data) and press [↵].	
	Do not load standard data except when EEPROM is replaced.					

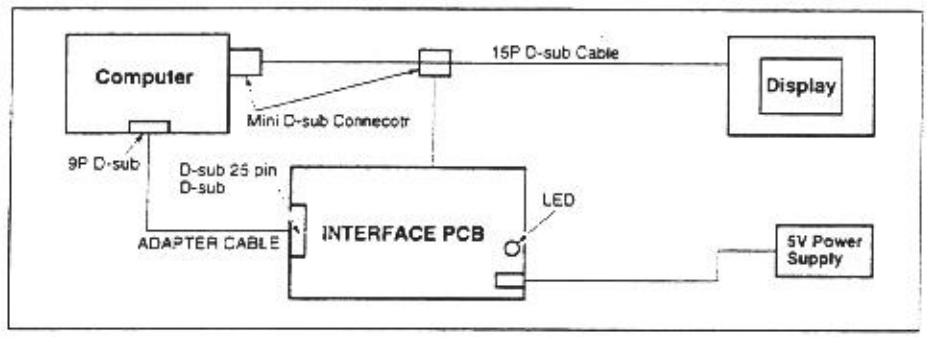
TECHNICAL INFORMATION FOR DDC

- This DDC is manufactured to the same specifications as the 15GA -1 monitor in terms of servicing. Therefore, the following is necessary when replacing the main PCB. When replacing the main PCB, IC1320 should be removed from the old board and installed in the new board. Be sure to test the monitor for normal operation after such a replacement.

- It must be noted that this monitors is designed to be applicable to DDC1 communication the following points are different from ordinary monitors.
  1. Use the signal cable, the which is furnished as an accessory (applicable to DDC1) only.
  2. When replacing a PCB on which ROM for DDC1 is mounted, data writing is required.
     In addition to the above, a computer applicable to WINDOWS and a 5V power supply unit are required.

- DDC1 Data Read/write System
  1. Communication jig
     (1) The composition of Communication jig
     ① Interface PCB. ② Adapter cable (D-SUB 25P → 9P) ③ 15P D-SUB cable

     (2) Connection diagram for communication jig.

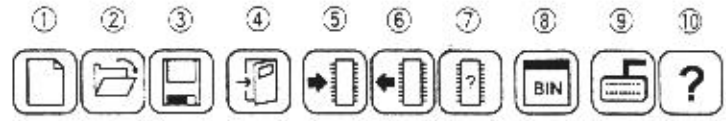


     (3) Procedure to turn on the power:
     ① Make connections as shown above.
     ② Turn on the computer.
     ③ Turn on the power supply of communication jig.
     ④ Turn on the power supply of the MONITOR.
     (Note) If the above-mentioned operation is normal, LED of the communication jig turns green after step (4).
     If this LED is red, repeat the steps (3) and (4).

     (4) Confirmation of DDC mode
     LED is mounted on the communication jig. According to its color, the DDC mode can be discriminated.
     - When LED is green. DDC1 mode.
     - When LED is orange. DDC2B mode.
     - When LED is red. Transmission error.
     - When LED is not lit. Obsolete.

  2. Preliminary arrangements for using DDC data read/write software
     (1) Copy DDC WRITE. EXE from floppy disk to hard disk drive (Name: ＼**ViewTool** Directory).
     (2) Register DDC data read/write software (DDCWRITE.EXE) in the Icon.
     ① Click the menu bar "Icon" of the program manager.
     ② Select "register and group create" from the pull down menu.
     ③ Select "group create."
     ④ Name the group PanaTool and register the group.
     ⑤ Repeat (1) and (2) again and select "Icon registration."
     ⑥ Enter "DDC1/2B" for [Title] and "Hard disk drive name: ＼**ViewTool** ＼DDCWRITE. EXE" for [Command line]. Then select [OK]
  3. How to use DDC data read/write software.
     (1) Start of DDC data read/write software.
     Double-click the "DDC1/2B" Icon in the PanaTool group.
     (2) Meaning of a button displayed.
     The tool bar indicates the nine icons shown below.

These icons are explained, from left to right.



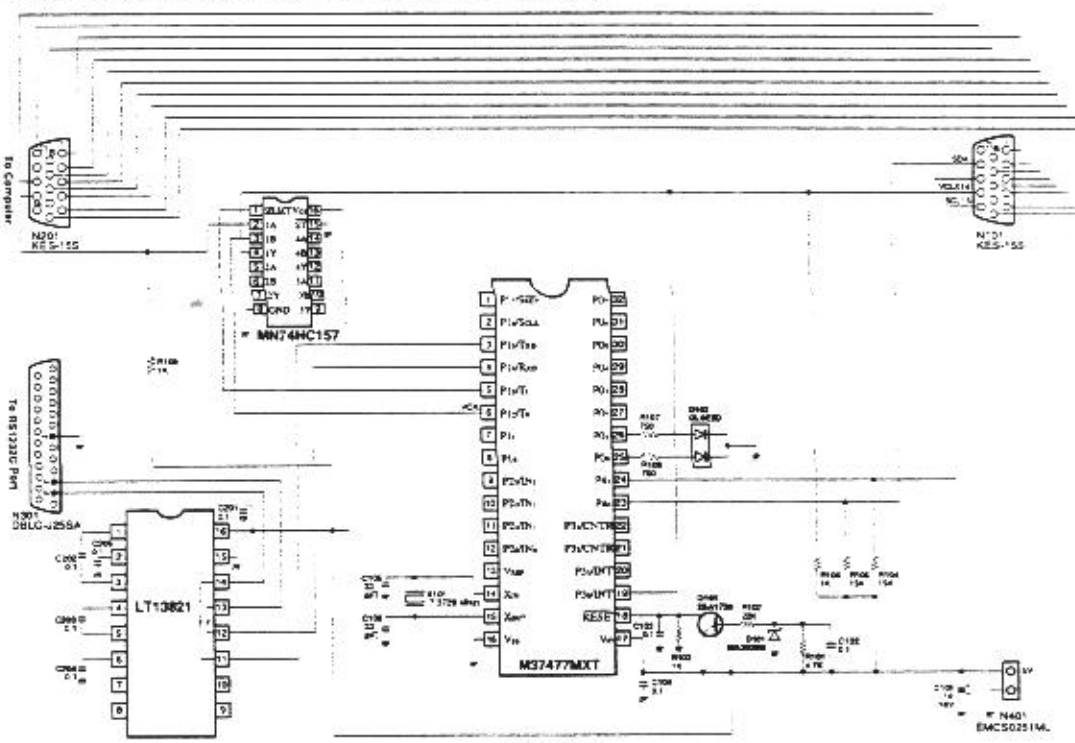
Icon ① : Initialization of screen display contents.
Icon ② : File is opened and displayed on the screen.
Icon ③ : Data are stored in a file
Icon ④ : Finish the DDC data read/write software.
Icon ⑤ : Data displayed on the screen are written in EEPROM.
Icon ⑥ : Contents of EEPROM are displayed on the screen.
Icon ⑦ : Contents of EEPROM are compared with the data displayed on the screen.
Icon ⑧ : Check binary data by text format.
Icon ⑨ : Communication port setting.
Contents of setting : PORT → Using Communication port No.
Baud rate → 9600, Data → 8 bits, Parity → Nil, Stop → 1 bits
Icon ⑩ : Version information display.

(3) Using the tool bar explained in (2) above, write data in EEPROM and make operations of reading, etc. A pop-up window may be displayed on the way. In such a case, select a proper one according to the message.

(Example 1) EEPROM data are displayed on the screen.
① Click the icon (6th from the left) in the tool bar, with the arrow pointing from the memory chip
② Decided whether reading is started in DDC1 mode or DDC2B mode.
③ Select START.

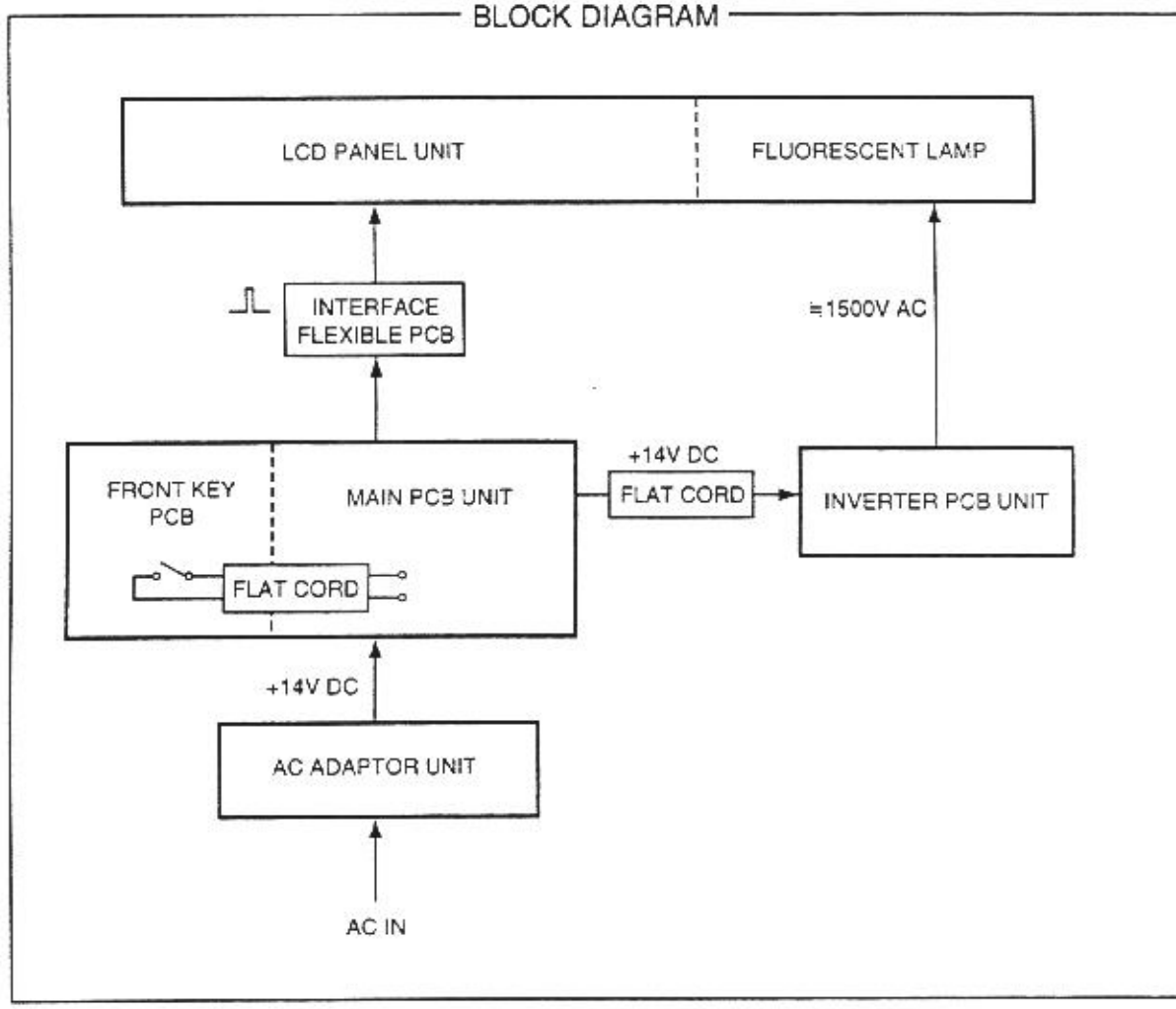
(Example 2) Data displayed on the screen are written in EEPROM.
① Click the icon (5th from the left) in the tool bar, with the arrow pointing toward in the memory chip
② Select START.

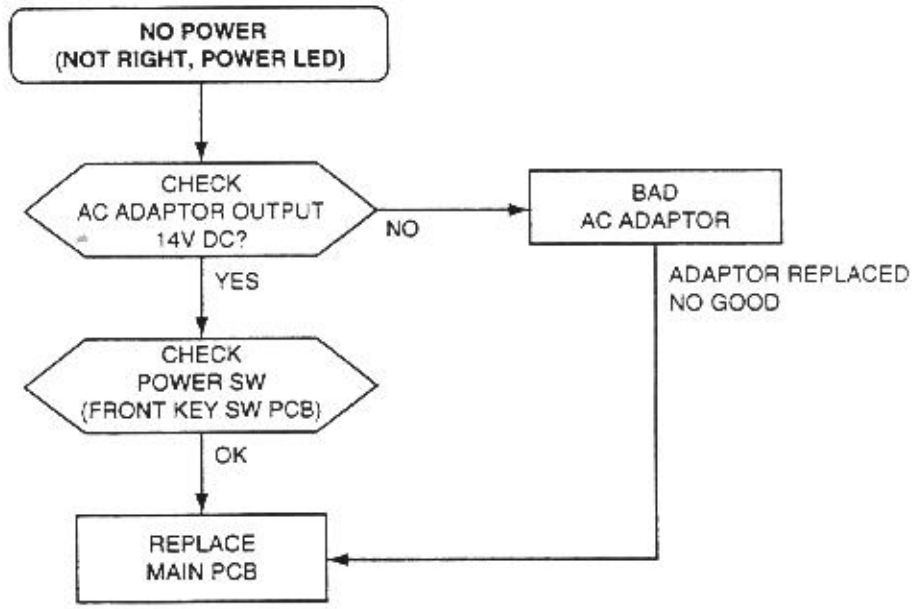
SCHEMATIC DIAGRAM FOR INTERFACE

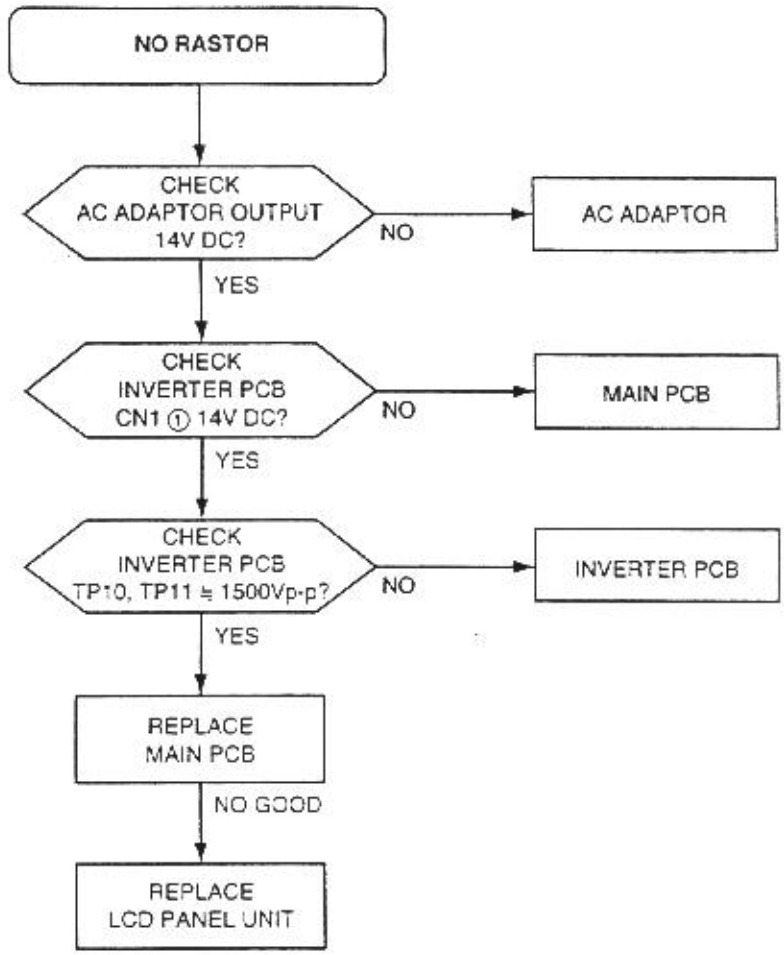


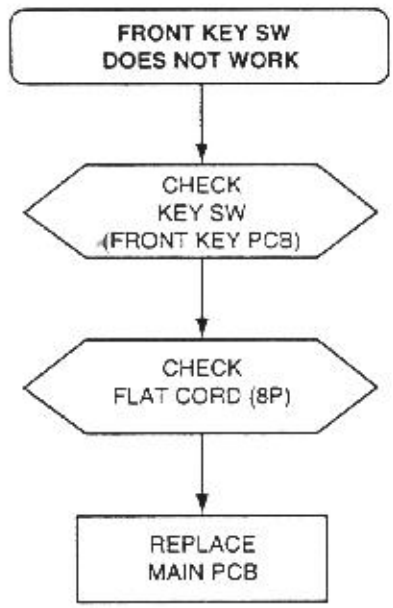
TROUBLE SHOOTING HINTS

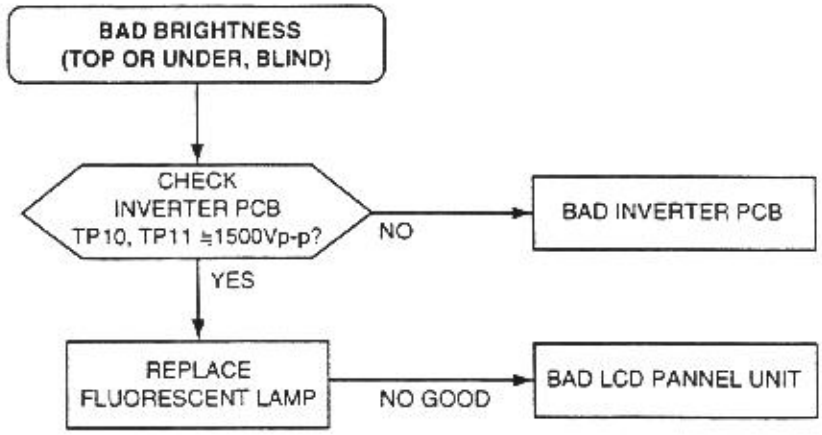
BLOCK DIAGRAM

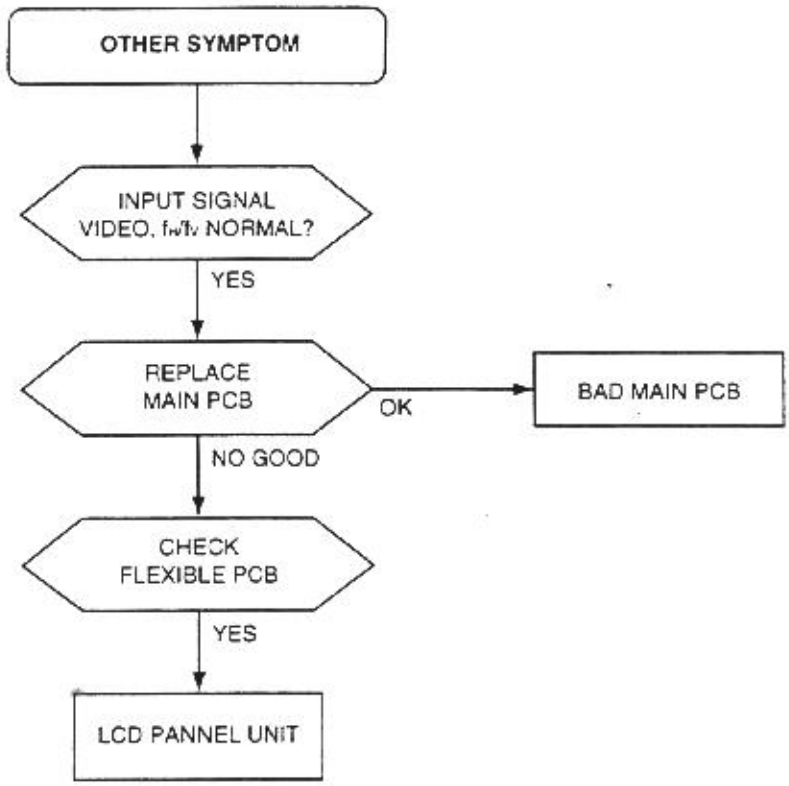





NO RASTOR
CHECK
AC ADAPTOR OUTPUT
14V DC?
NO
AC ADAPTOR
YES
CHECK
INVERTER PCB
CN1 ① 14V DC?
NO
MAIN PCB
YES
CHECK
INVERTER PCB
TP10, TP11 ≒ 1500Vp-p?
NO
INVERTER PCB
YES
REPLACE
MAIN PCB
NO GOOD
REPLACE
LCD PANEL UNIT

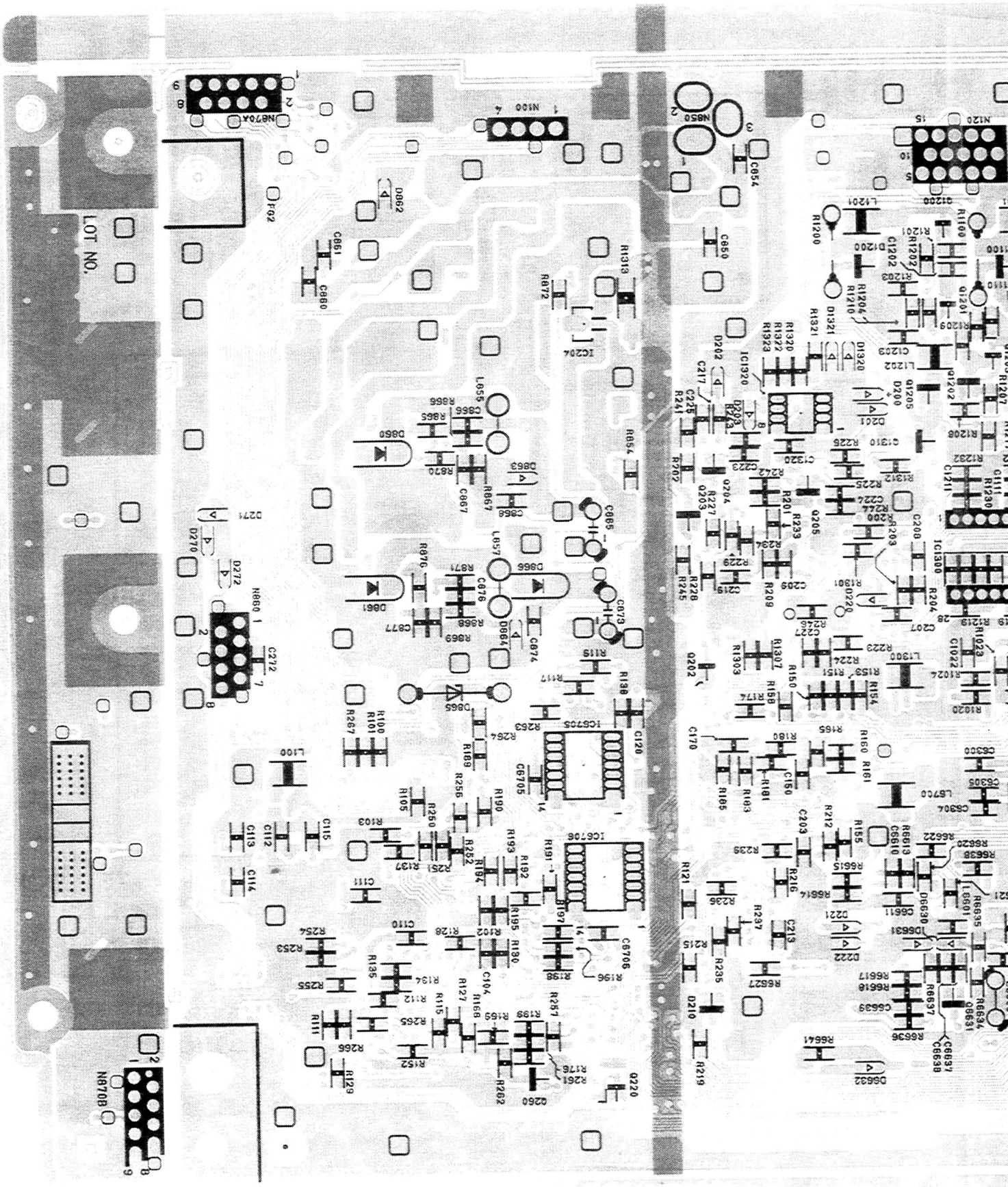

FRONT KEY SW
DOES NOT WORK
CHECK
KEY SW
(FRONT KEY PCB)
CHECK
FLAT CORD (8P)
REPLACE
MAIN PCB


BAD BRIGHTNESS
(TOP OR UNDER, BLIND)
CHECK
INVERTER PCB
TP10, TP11 ≒1500Vp-p?
NO
BAD INVERTER PCB
YES
REPLACE
FLUORESCENT LAMP
NO GOOD
BAD LCD PANNEL UNIT

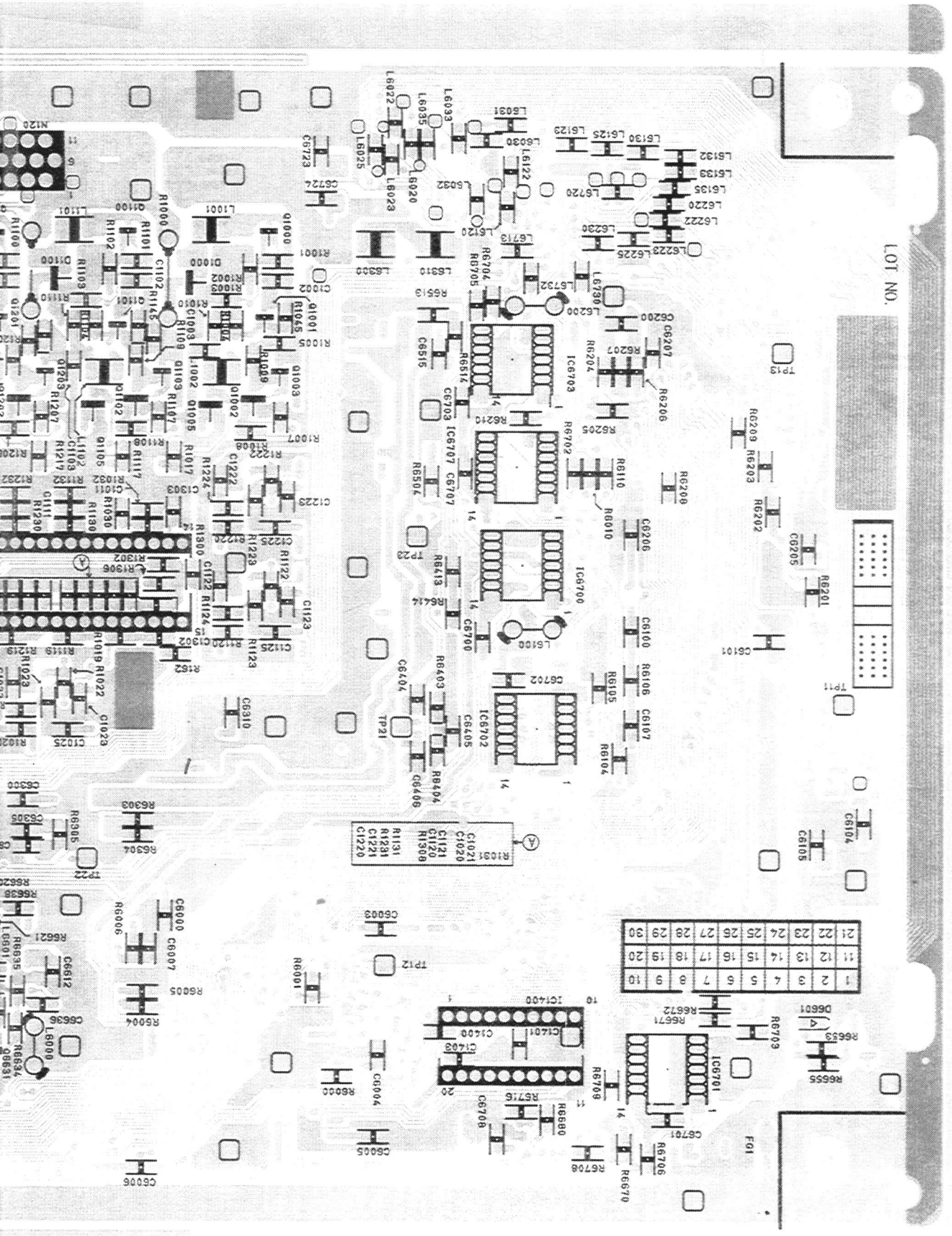

OTHER SYMPTOM
INPUT SIGNAL
VIDEO, fH/fV NORMAL?
YES
REPLACE
MAIN PCB
OK
BAD MAIN PCB
NO GOOD
CHECK
FLEXIBLE PCB
YES
LCD PANNEL UNIT

MAIN BOARD (Solder side)

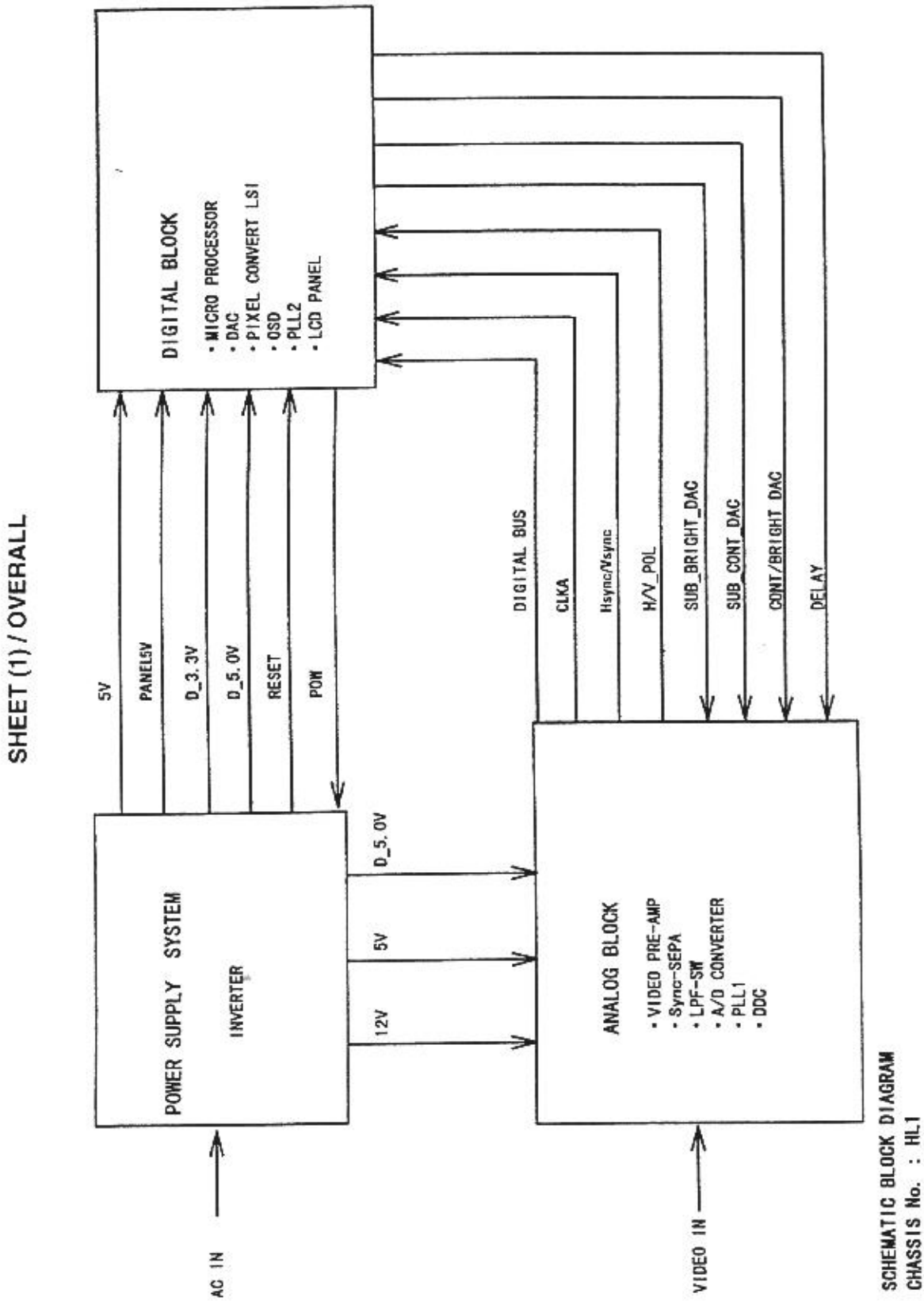
Model: VSLCD101-



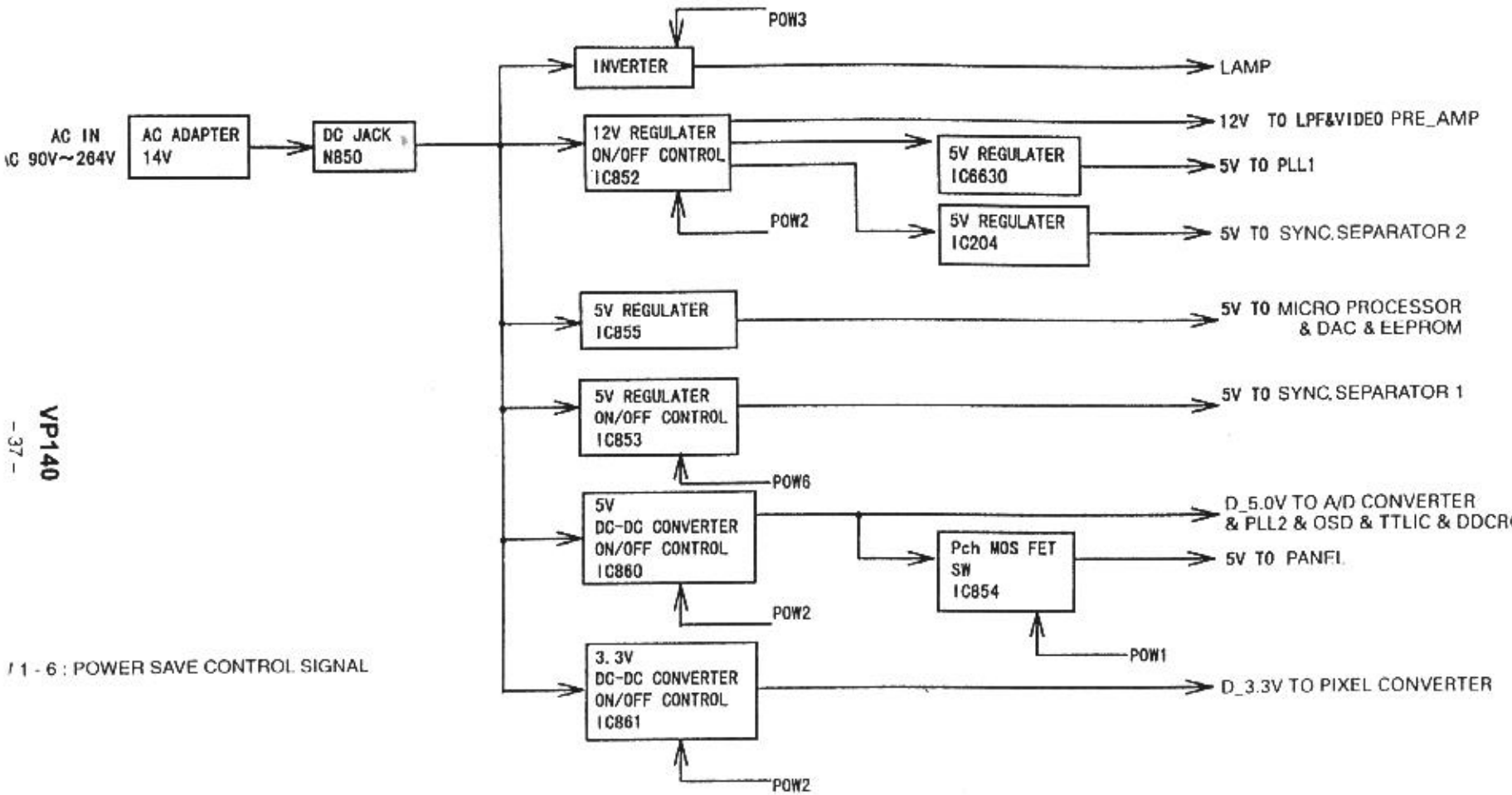
CD101-1


LOT NO.
IC6700
IC6701
IC6702
IC6703
IC1400
TP11
TP12
TP13
TP21
TP22
TP23
FG1

BLOCK DIAGRAM



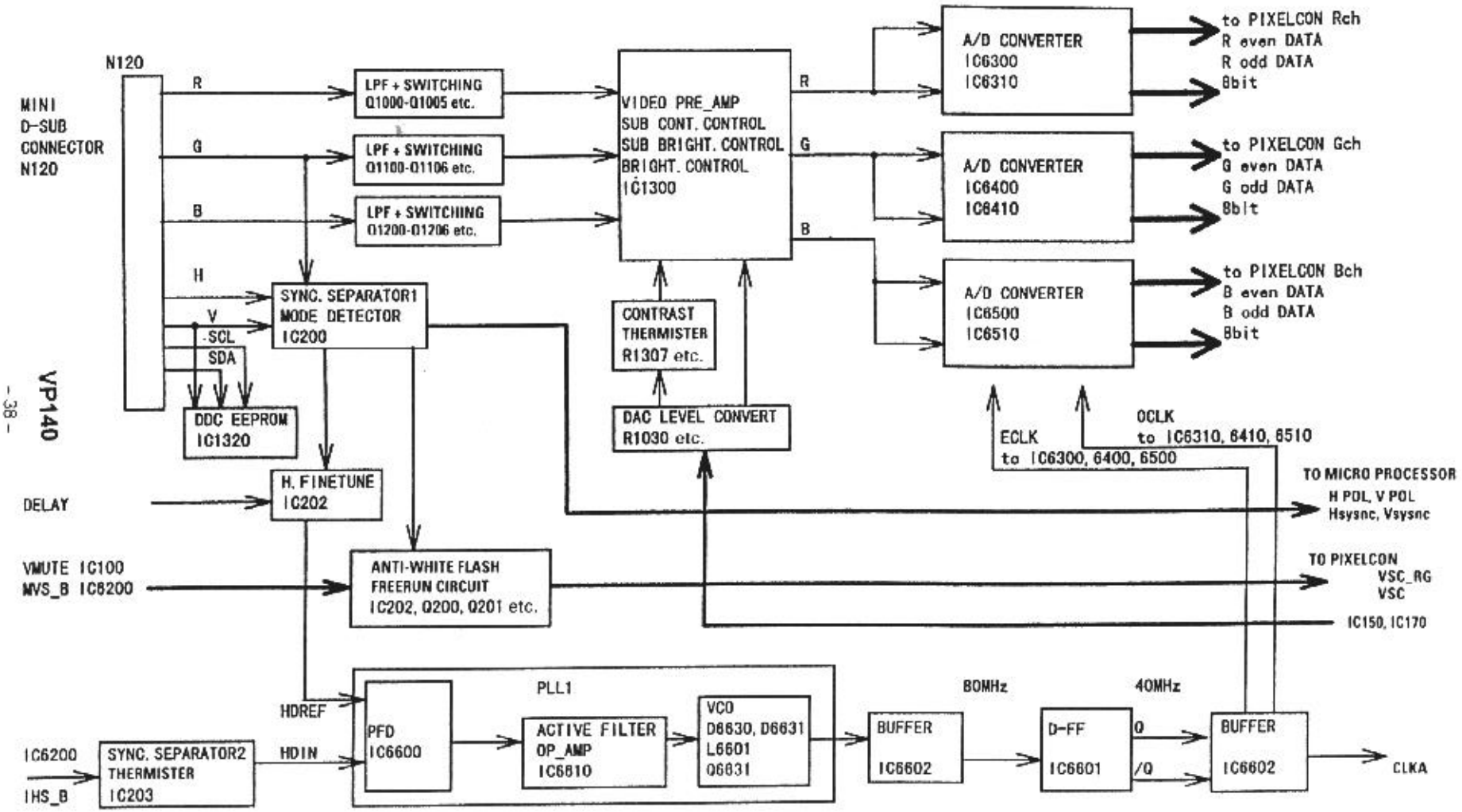
SHEET (2) / POWER SUPPLY



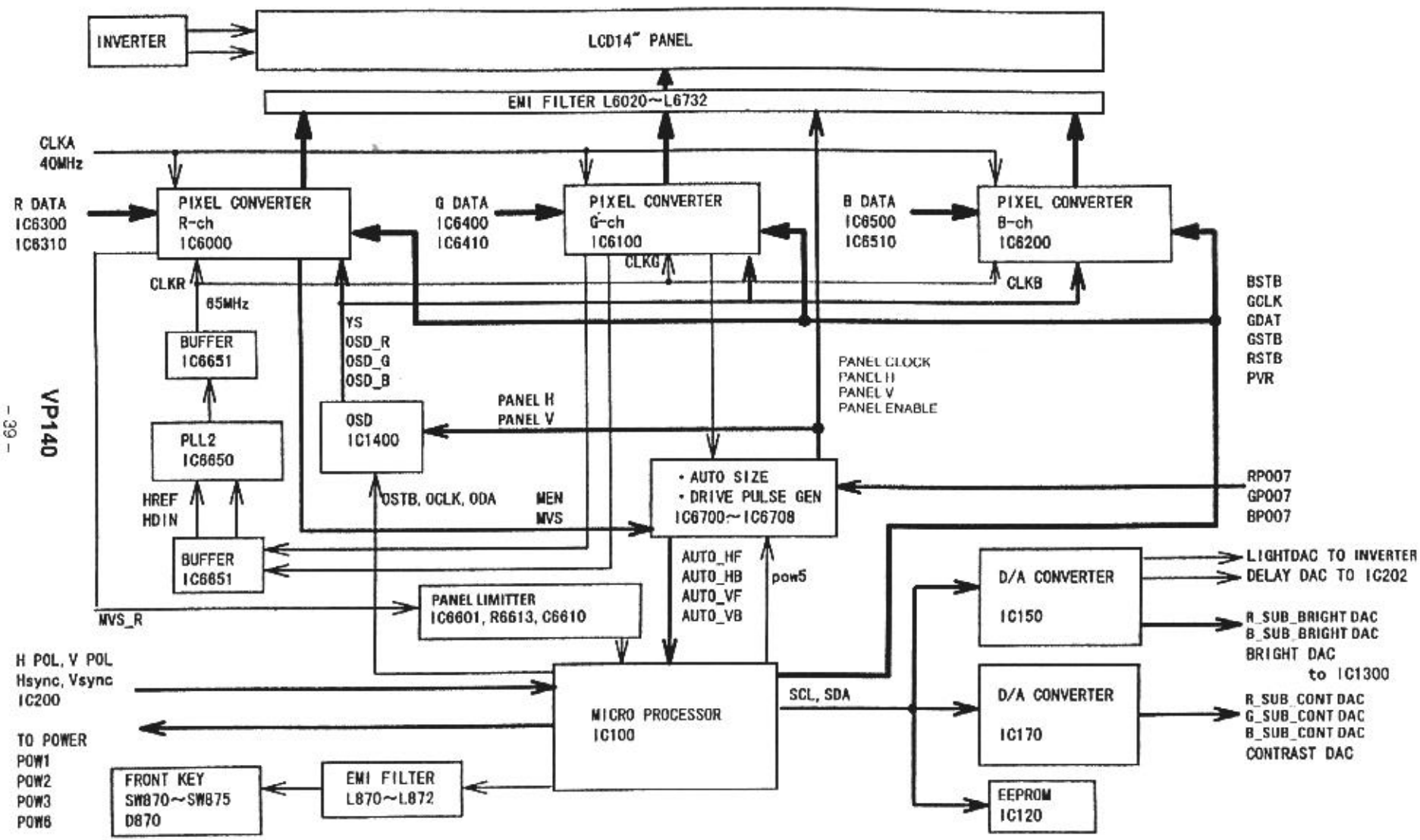
/ 1 - 6 : POWER SAVE CONTROL SIGNAL

ViewSonic Corporation

SHEET (3) / ANALOG

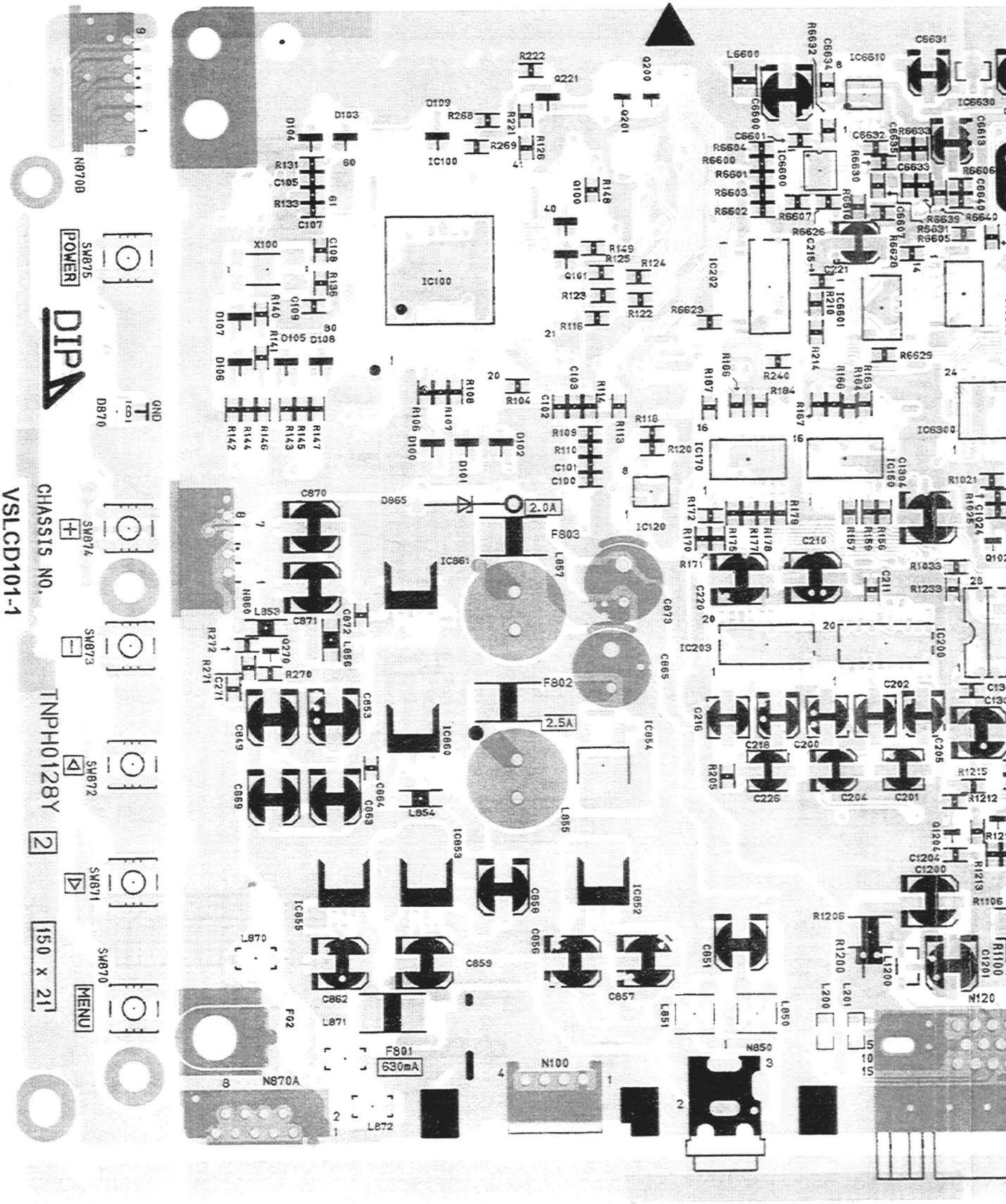


SHEET (4) / DIGITAL

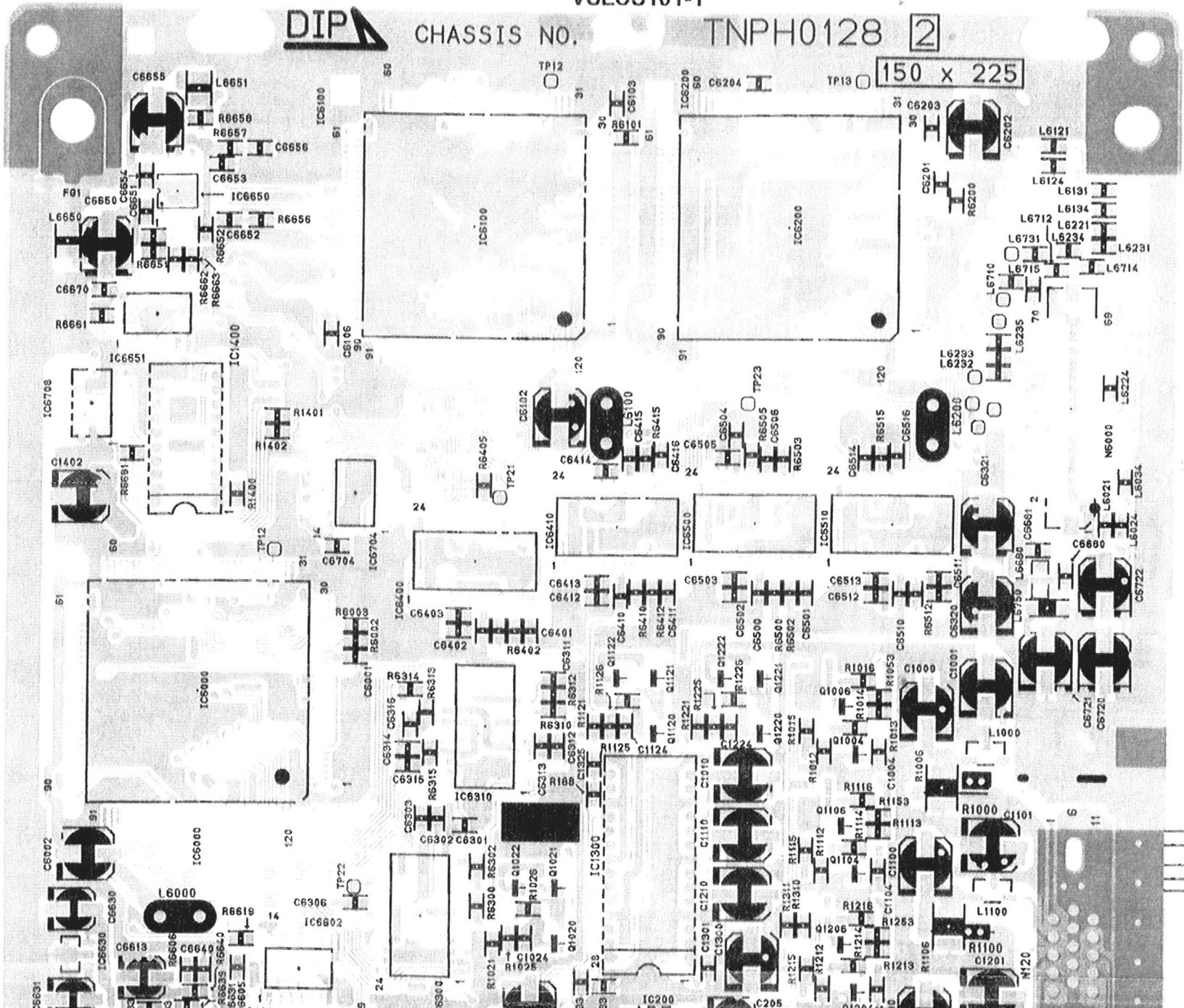


MAIN BOARD (Parts side)

Model: VSLCD101-1

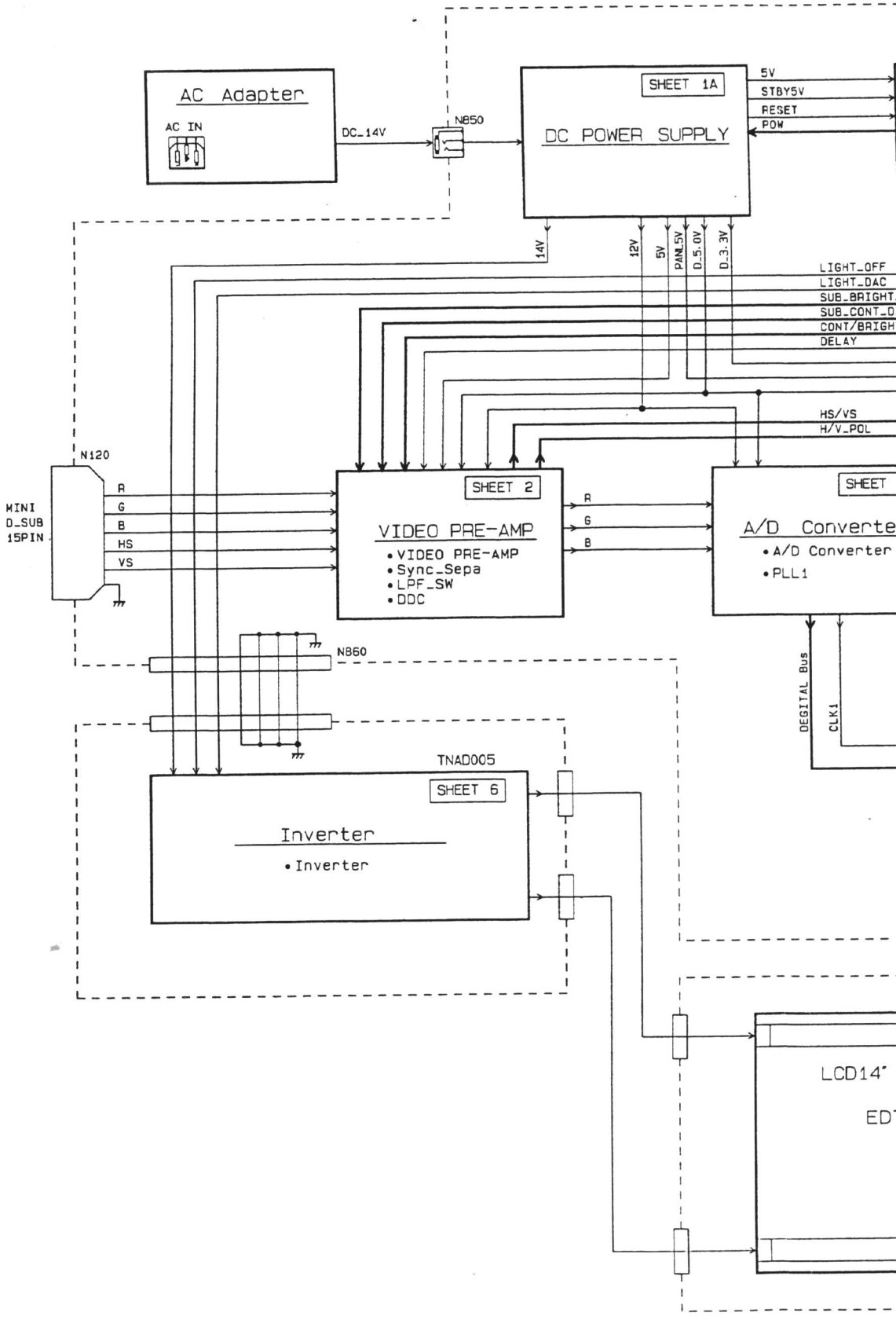


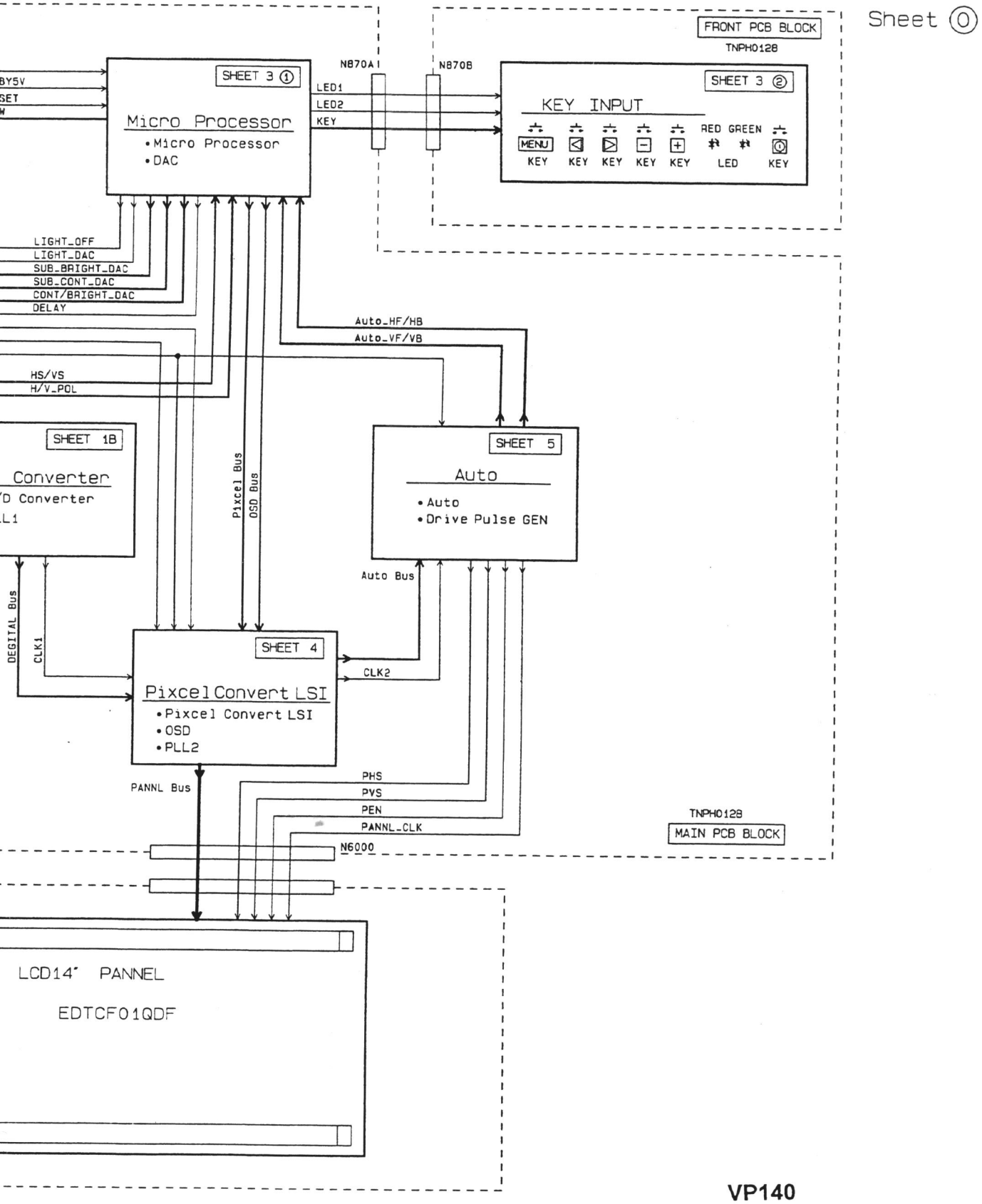
VSLCS101-1

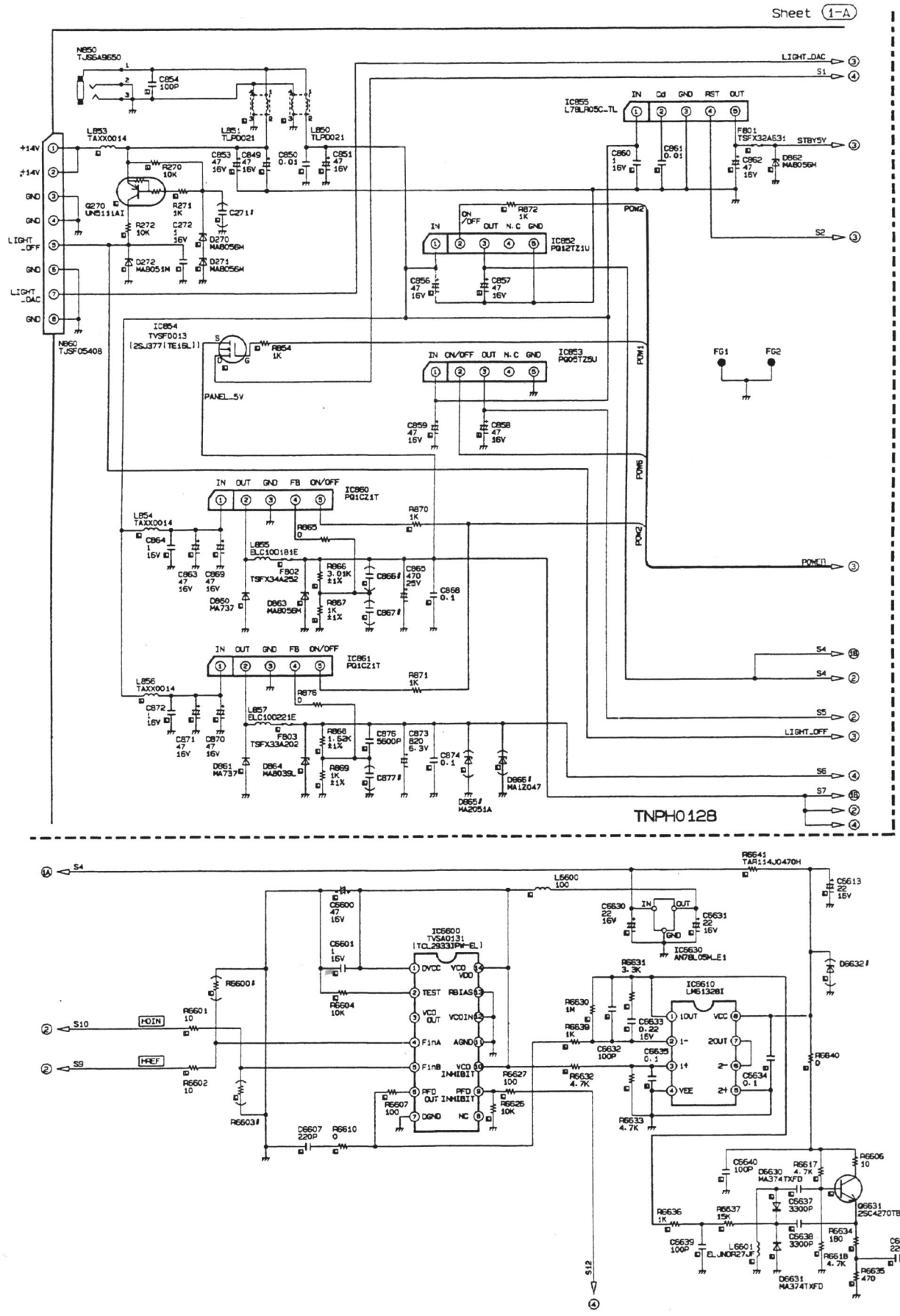

DIP
CHASSIS NO.
TNPH0128 2
150 x 225
IC6100
IC6200
IC6651
IC1400
IC6000
IC6310
IC1300
IC6602
IC200
IC6400
IC6410
IC6500
IC6510
IC6704
L6000
L1000
L1100
TP12
TP13
TP21
TP22
TP23
VP140

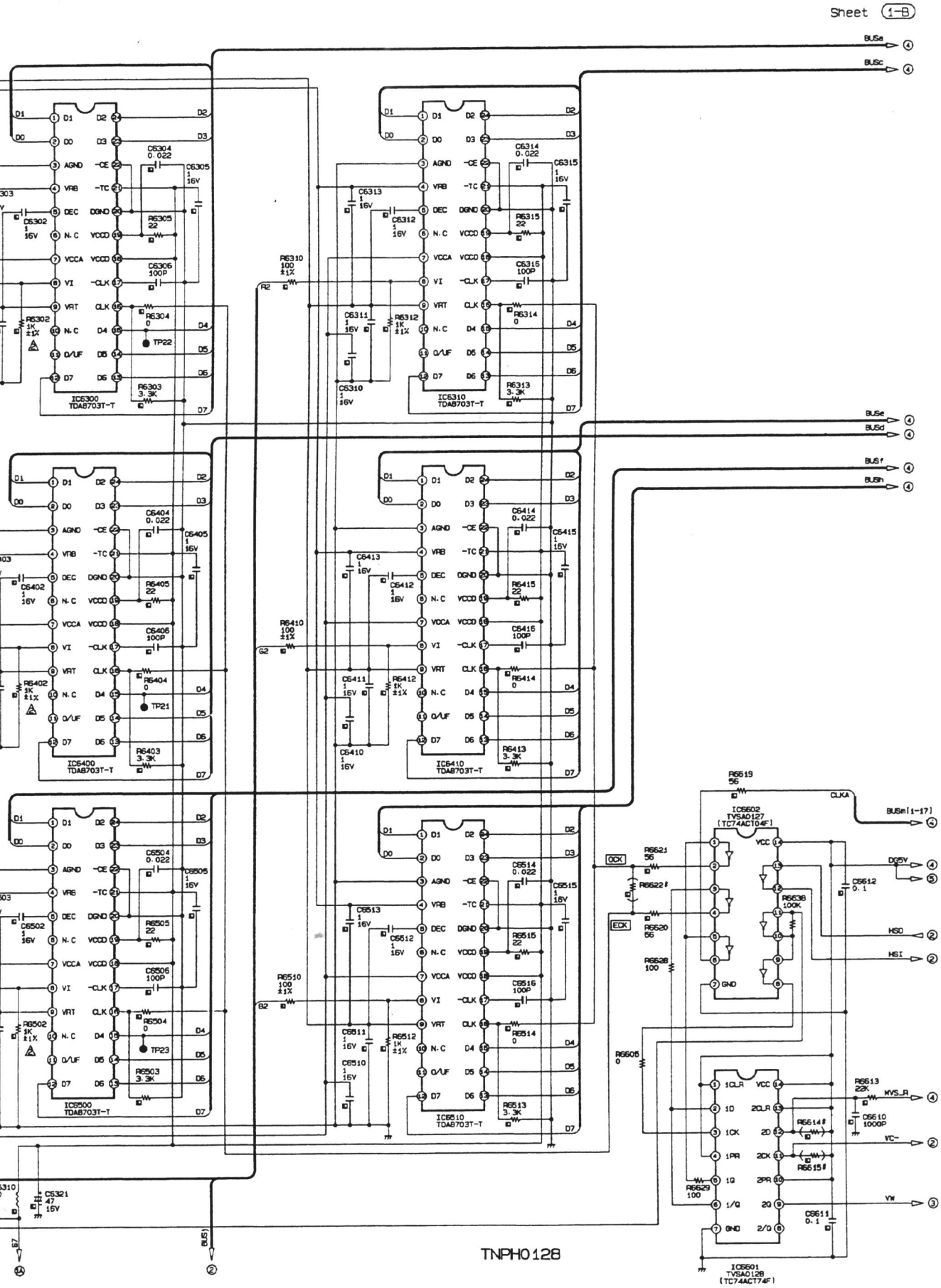
IMPORTANT SAFETY NOTICE

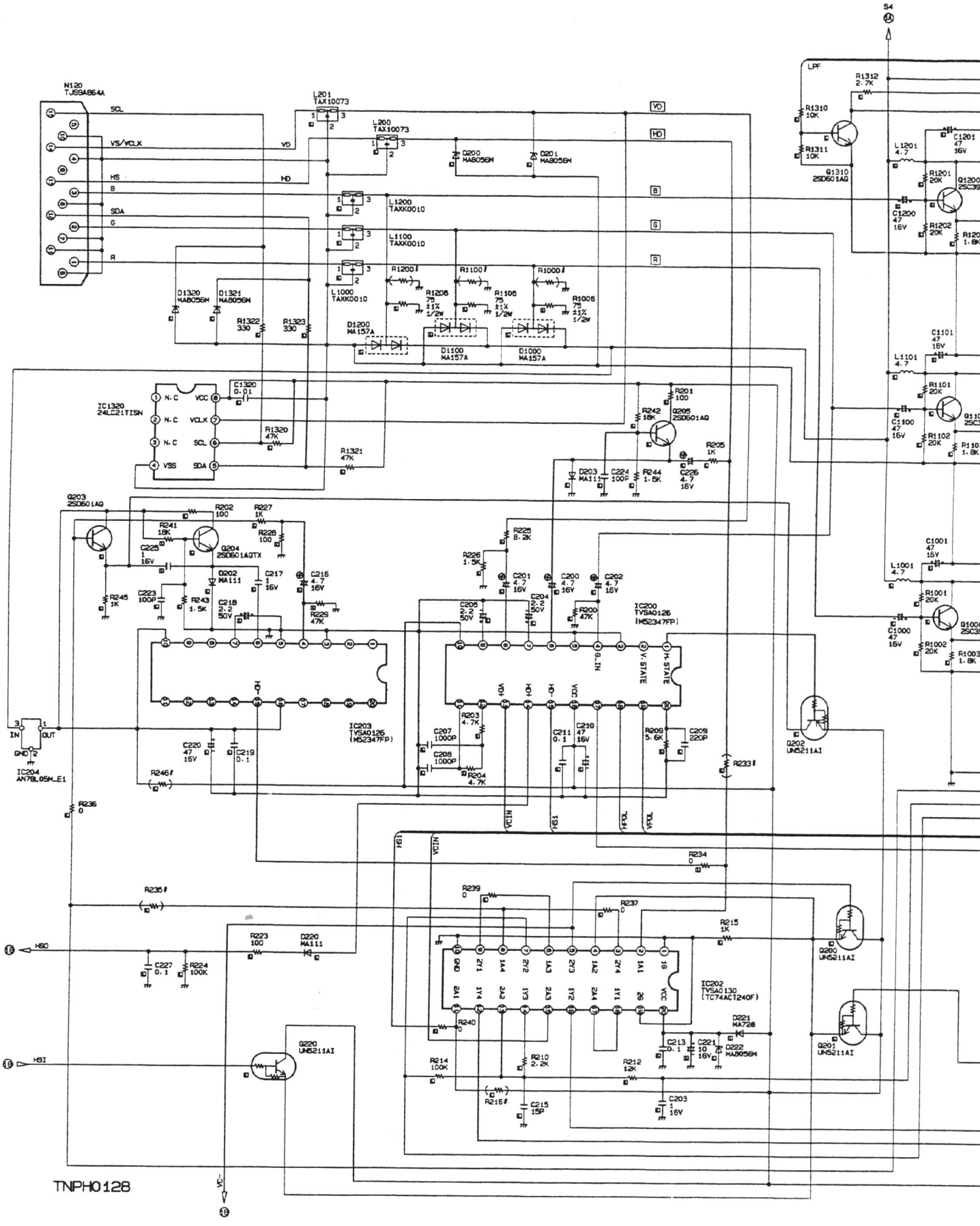
he component identified by shading or international symbol ⚠ on the following schematic diagrams incorporate special atures important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that nly manufacturer's specified parts be used for those critical components.



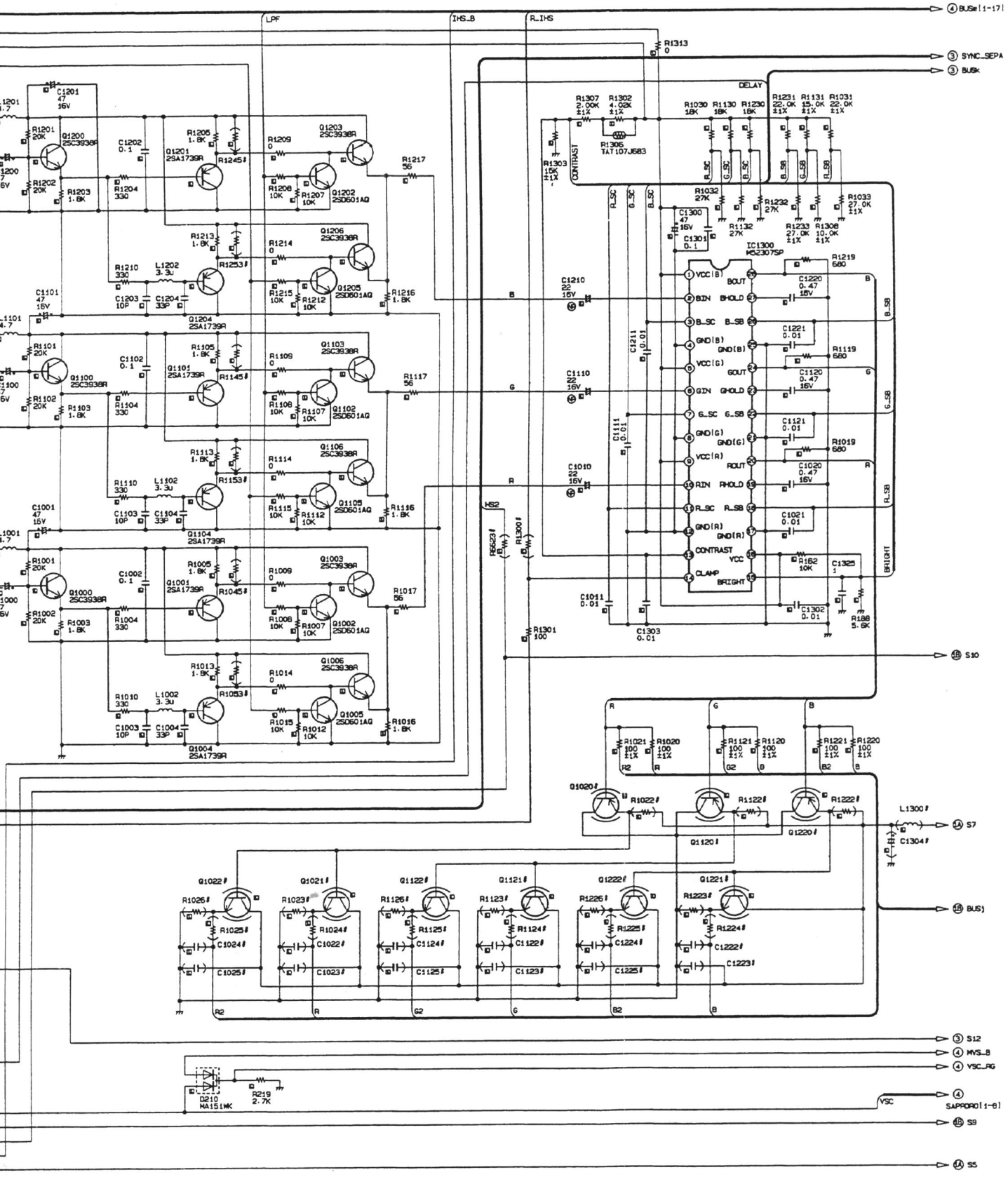

Sheet ⓪
FRONT PCB BLOCK
TNPH0128
SHEET 3 ①
Micro Processor
• Micro Processor
• DAC
N870A1
N870B
LED1
LED2
KEY
SHEET 3 ②
KEY INPUT
MENU KEY
KEY
KEY
KEY
KEY
RED GREEN LED
KEY
BY5V
SET
W
LIGHT_OFF
LIGHT_DAC
SUB_BRIGHT_DAC
SUB_CONT_DAC
CONT/BRIGHT_DAC
DELAY
Auto_HF/HB
Auto_VF/VB
HS/VS
H/V_POL
SHEET 1B
Converter
/D Converter
LL1
Pixcel Bus
OSD Bus
SHEET 5
Auto
• Auto
• Drive Pulse GEN
Auto Bus
DEGITAL Bus
CLK1
SHEET 4
Pixcel Convert LSI
• Pixcel Convert LSI
• OSD
• PLL2
CLK2
PANNL Bus
PHS
PVS
PEN
PANNL_CLK
N6000
TNPH0128
MAIN PCB BLOCK
LCD14" PANNEL
EDTCF01QDF


Sheet 1-A
TNPH0128

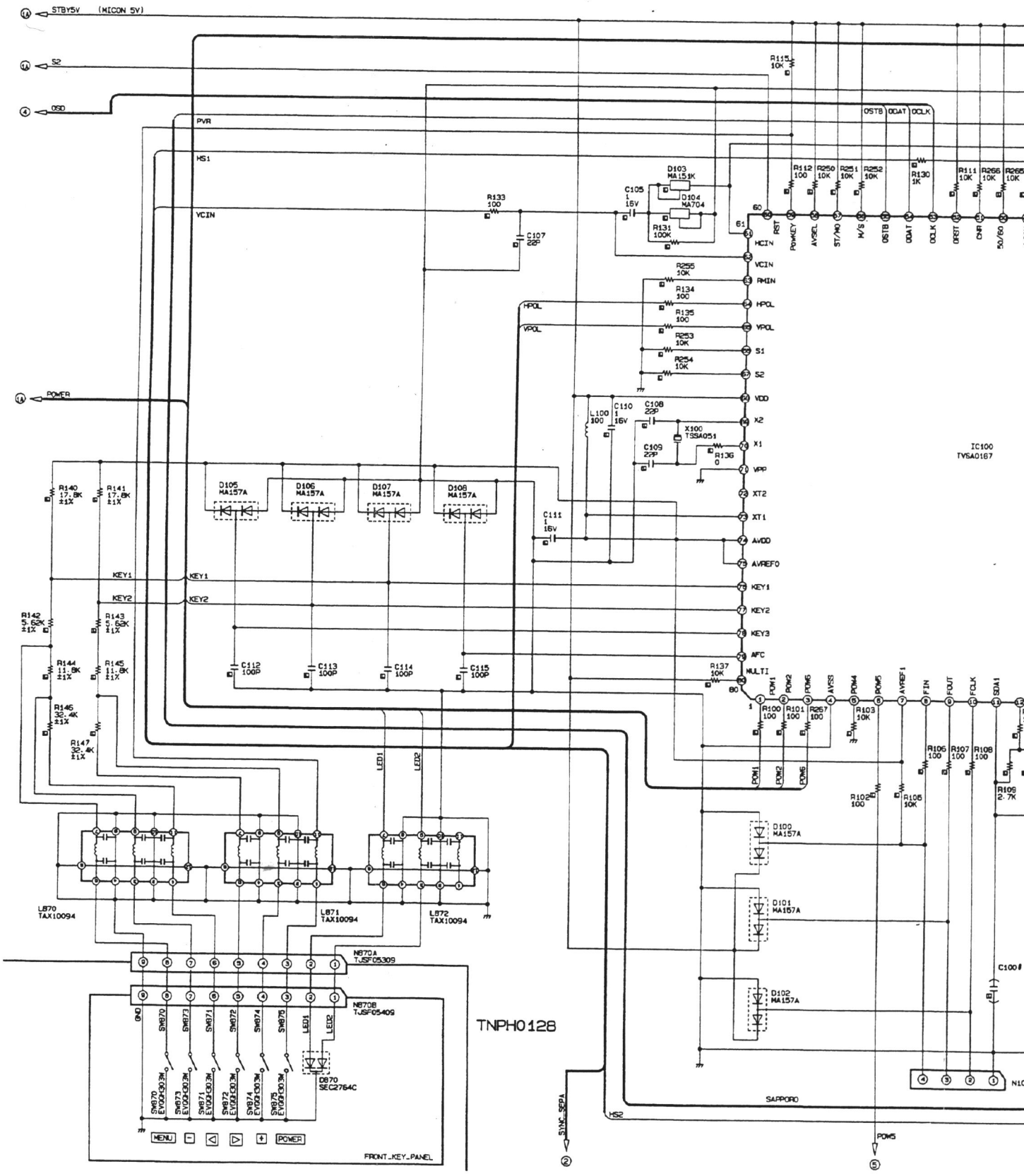

Sheet 1-B
BUSa
BUSc
BUSe
BUSd
BUSf
BUSh
IC6300 TDA8703T-T
IC6310 TDA8703T-T
IC6400 TDA8703T-T
IC6410 TDA8703T-T
IC6500 TDA8703T-T
IC6510 TDA8703T-T
IC6602 TVSA0127 (TC74ACT04F)
IC6601 TVSA0128 (TC74ACT74F)
TP22
TP21
TP23
CLKA
BUSm[1-17]
HSO
HSI
VC-
VM
MVS_A
TNPH0128

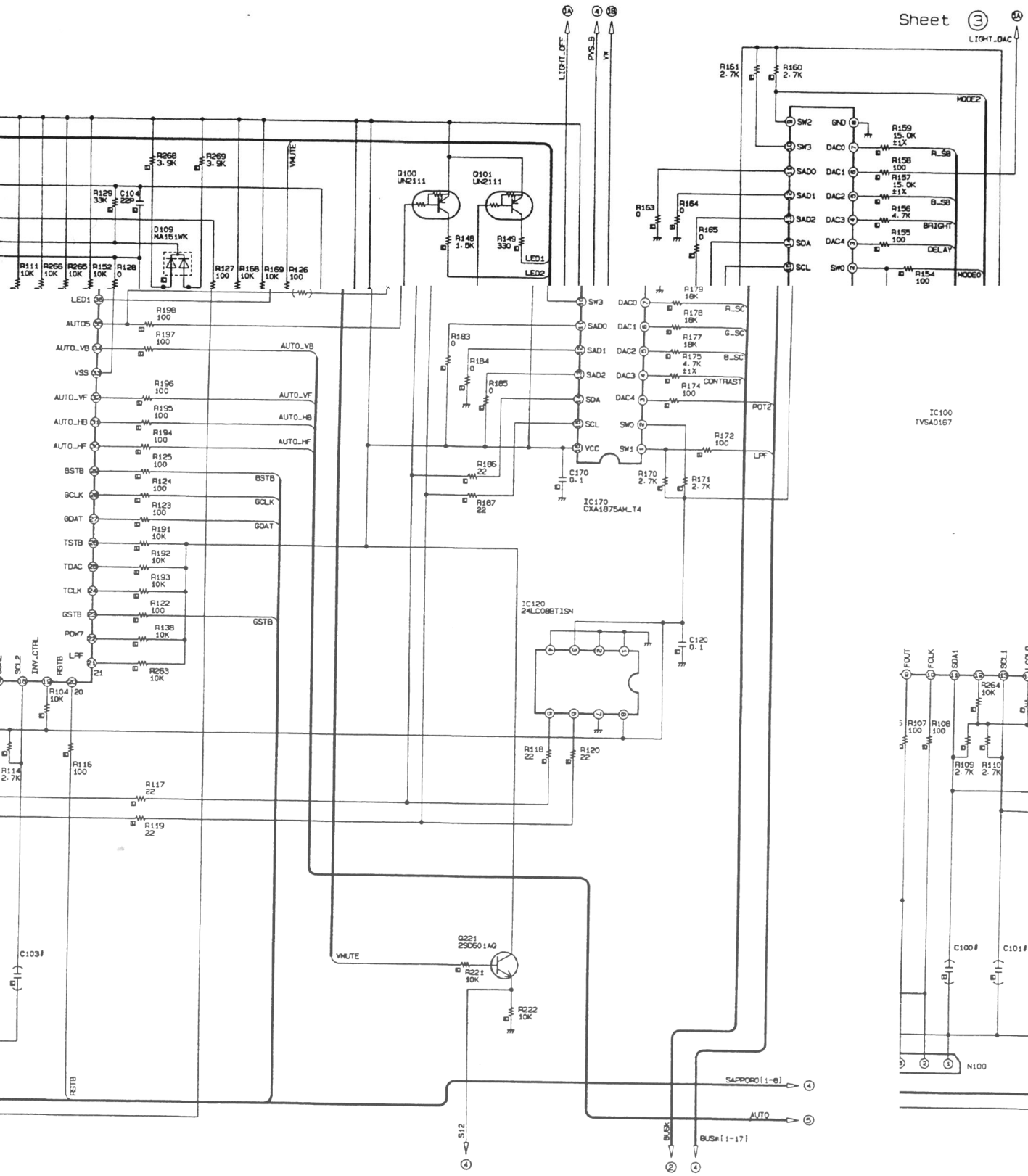

TNPH0128

Sheet ②

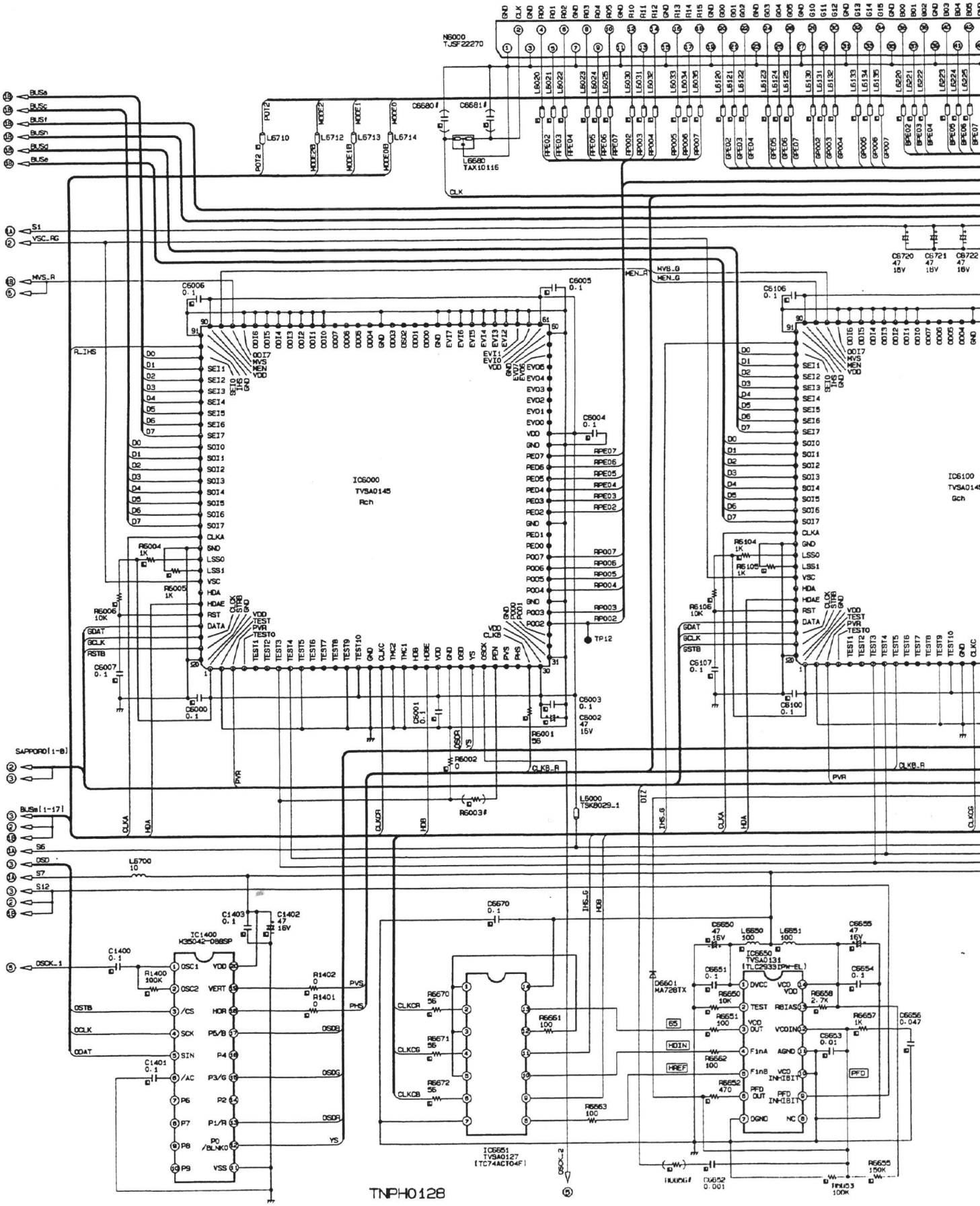


VP140

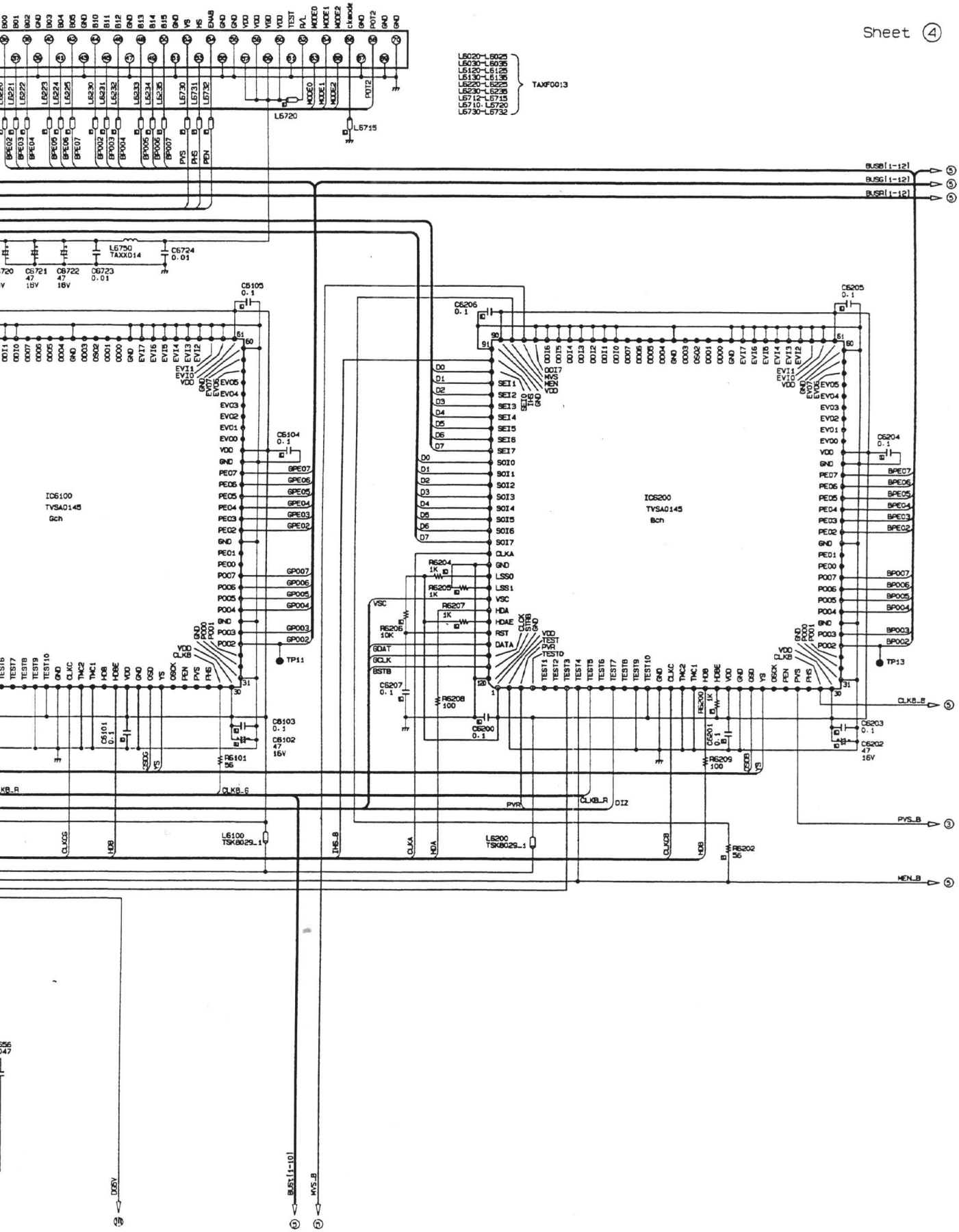

STBY5V (MICON 5V)
S2
OSD
PWR
HS1
VCIN
POWER
OSTB
ODAT
OCLK
HPOL
VPOL
IC100
TVSA0167
KEY1
KEY2
KEY3
AFC
MULTI
L870
TAX10094
L871
TAX10094
L872
TAX10094
N870A
TJSF05309
N870B
TJSF05409
TNPH0128
D870
SEC2764C
MENU
POWER
FRONT_KEY_PANEL
SAPPORO
SYNC_SEPA
HS2
PDW5

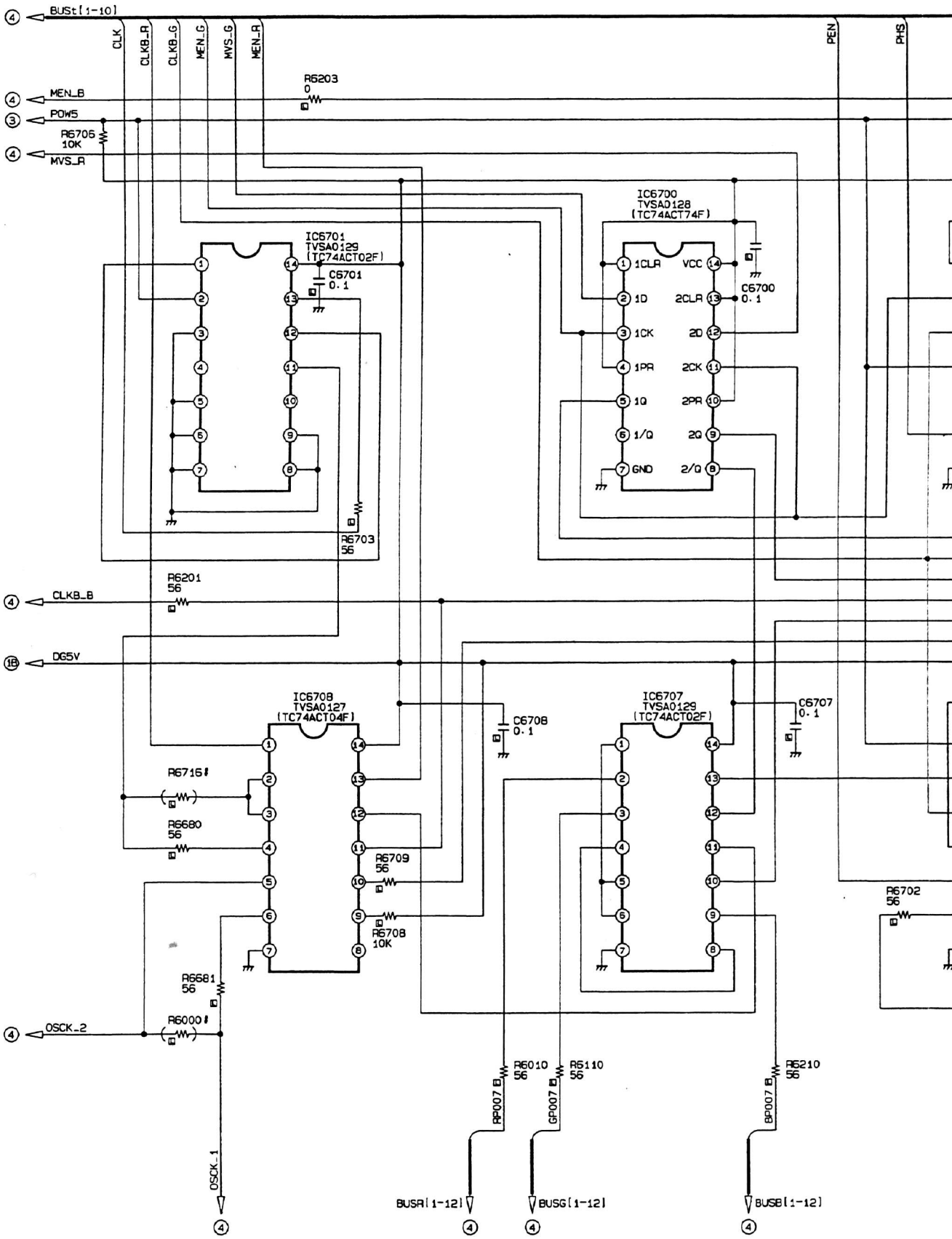

Sheet ③
LIGHT_DAC
LIGHT_OFF
PVS_B
VM
MODE2
MODE0
R_SB
B_SB
BRIGHT
DELAY
R_SC
G_SC
B_SC
CONTRAST
POT2
LPF
IC100
TVSA0167
IC170
CXA1875AM_T4
IC120
24LC08BTISN
Q100
UN2111
Q101
UN2111
Q221
2SD601AQ
D109
MA151WK
VMUTE
AUTO_VB
AUTO_VF
AUTO_HB
AUTO_HF
BSTB
GCLK
GDAT
GSTB
RSTB
SAPPORO[1-8]
AUTO
BUS#[1-17]
N100

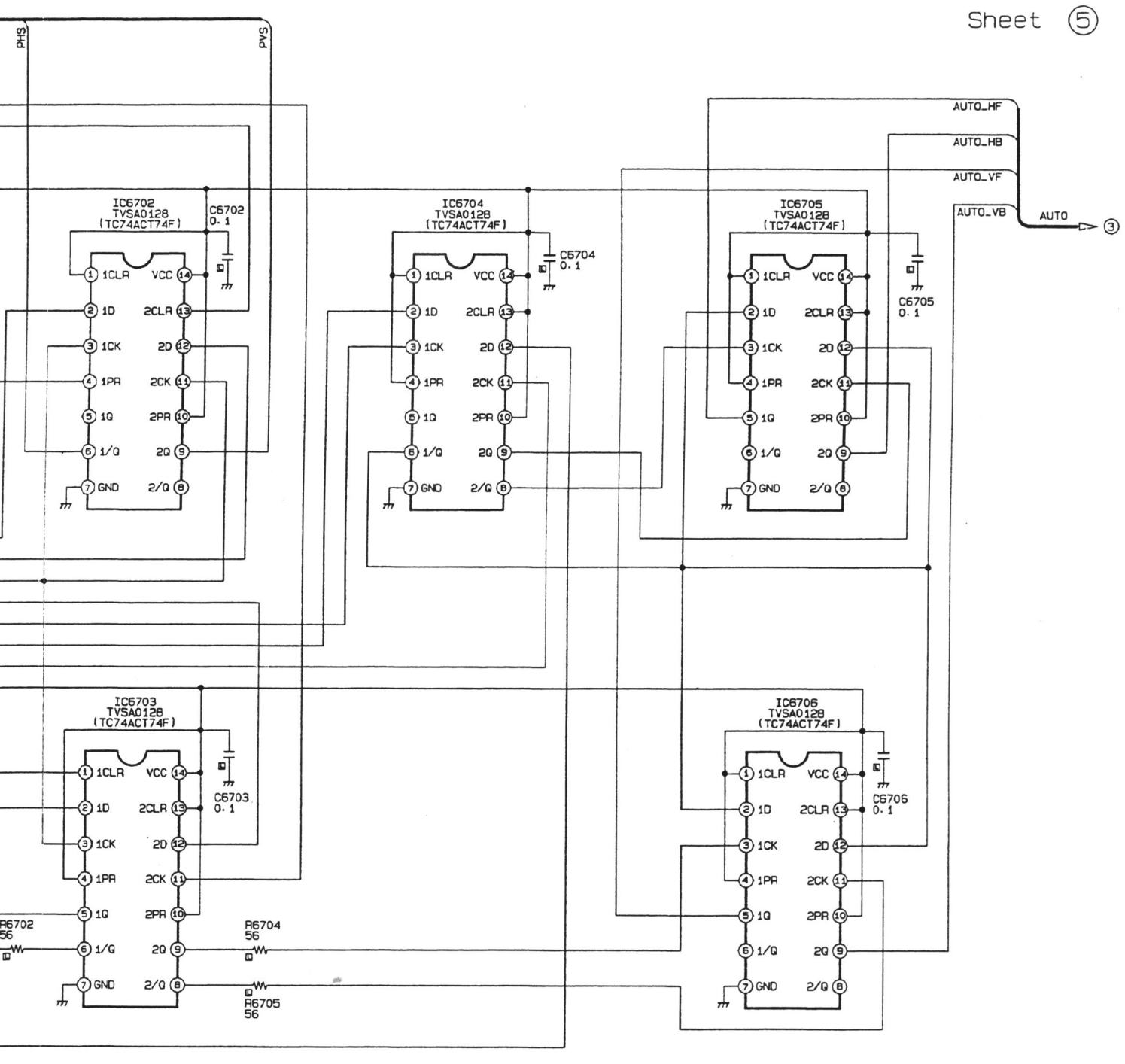
VP140


TNPH0128

Sheet ④

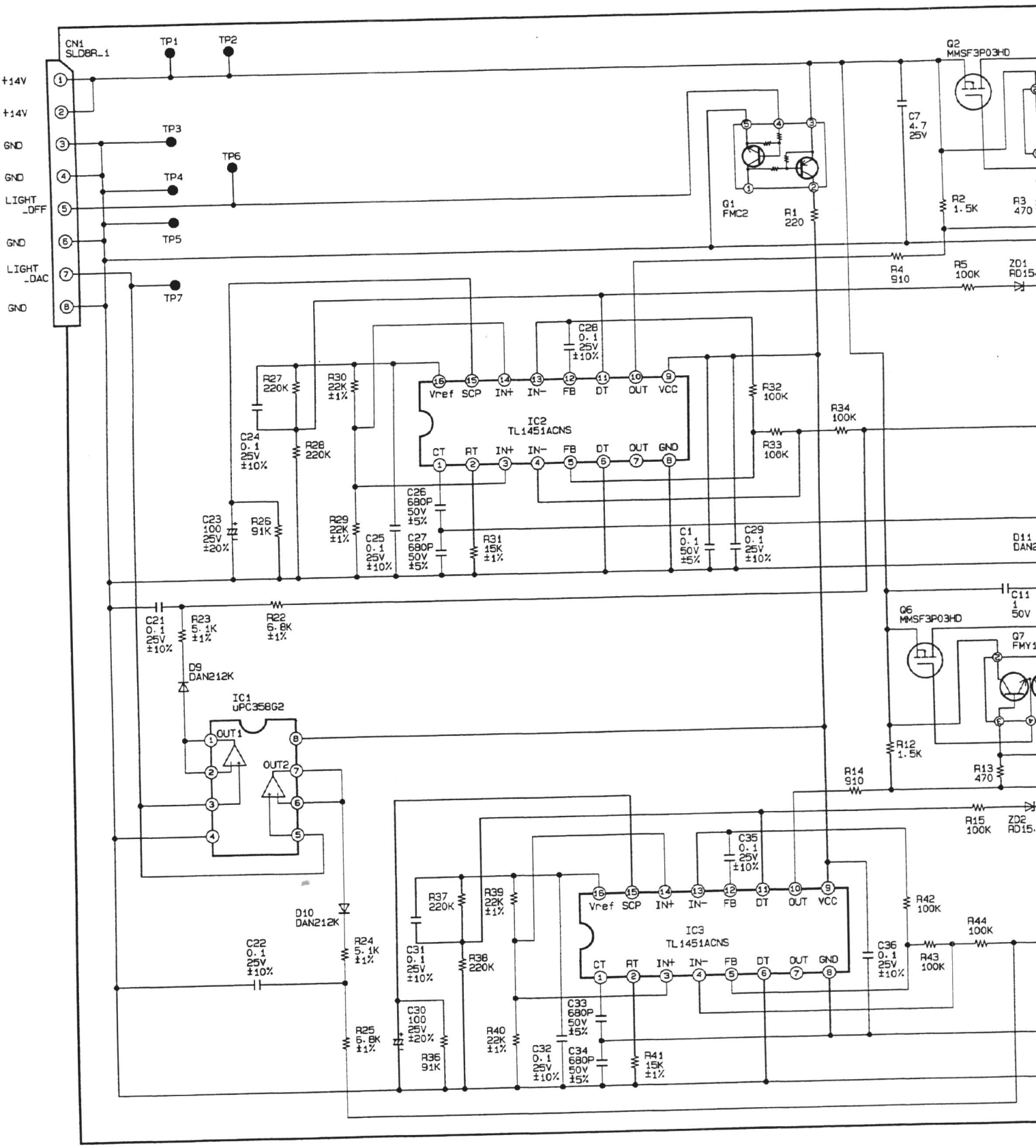

IC6100
TVSA0145
Gch
IC6200
TVSA0145
Bch
L6720
L6715
L6750
TAXX014
TAXF0013
TP11
TP13
BUSB[1-12]
BUSG[1-12]
BUSR[1-12]
CLKB_B
PVS_B
MEN_B
L6100
TSK8029_1
L6200
TSK8029_1
BUS[1-10]
MVS_B

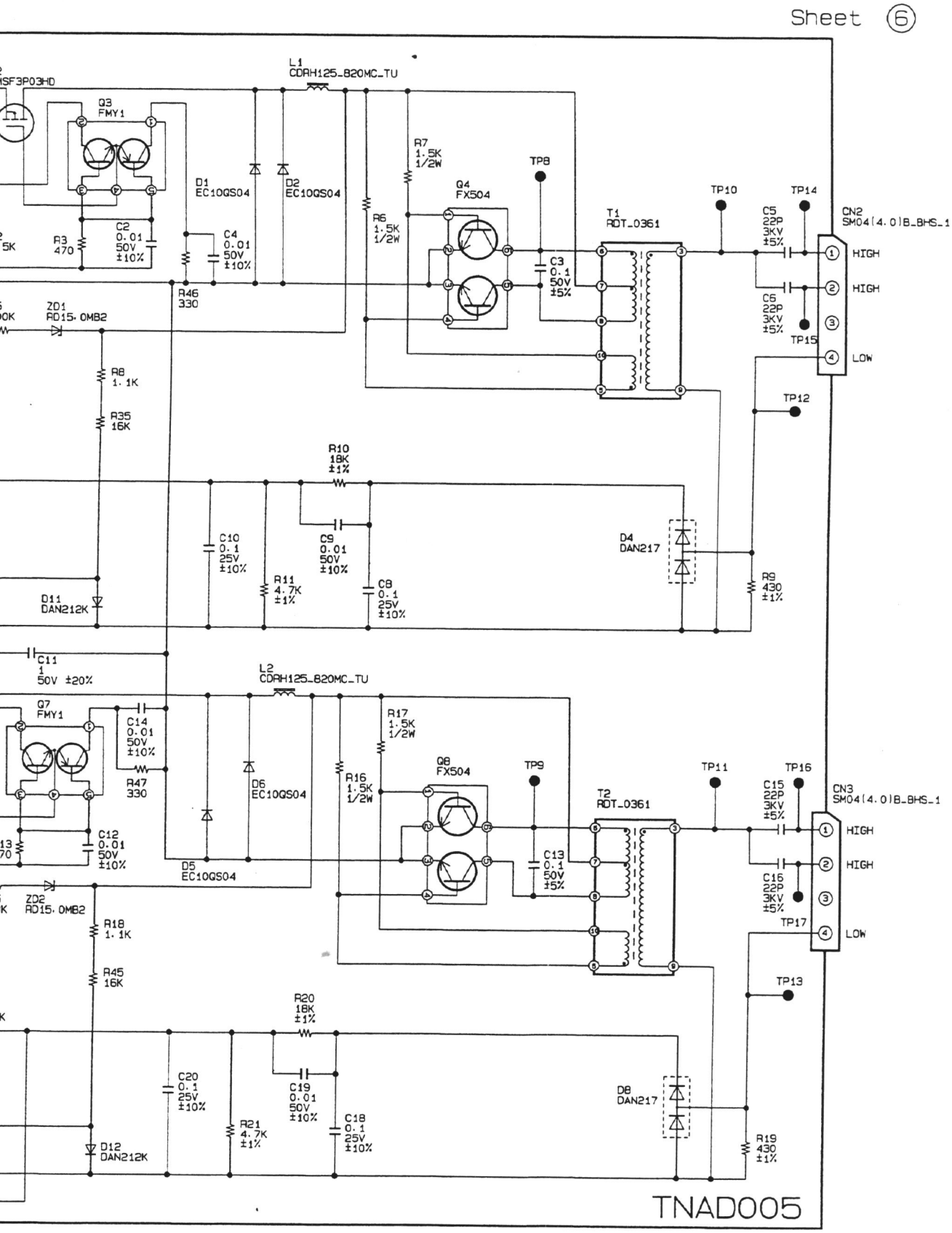

BUSt[1-10]
CLK
CLKB_A
CLKB_G
MEN_G
MVS_G
MEN_A
PEN
PHS
MEN_B
POWS
MVS_A
R6203
0
R6705
10K
IC6700
TVSA0128
(TC74ACT74F)
IC6701
TVSA0129
(TC74ACT02F)
C6701
0.1
C6700
0.1
1CLR
VCC
1D
2CLR
1CK
2D
1PR
2CK
1Q
2PR
1/Q
2Q
GND
2/Q
R6703
56
R6201
56
CLKB_B
DG5V
IC6708
TVSA0127
(TC74ACT04F)
IC6707
TVSA0129
(TC74ACT02F)
C6708
0.1
C6707
0.1
R6716
R6680
56
R6709
56
R6708
10K
R6702
56
R6681
56
R6000
OSCK_2
OSCK_1
R6010
56
R5110
56
R5210
56
RP007
GP007
BP007
BUSR[1-12]
BUSG[1-12]
BUSB[1-12]



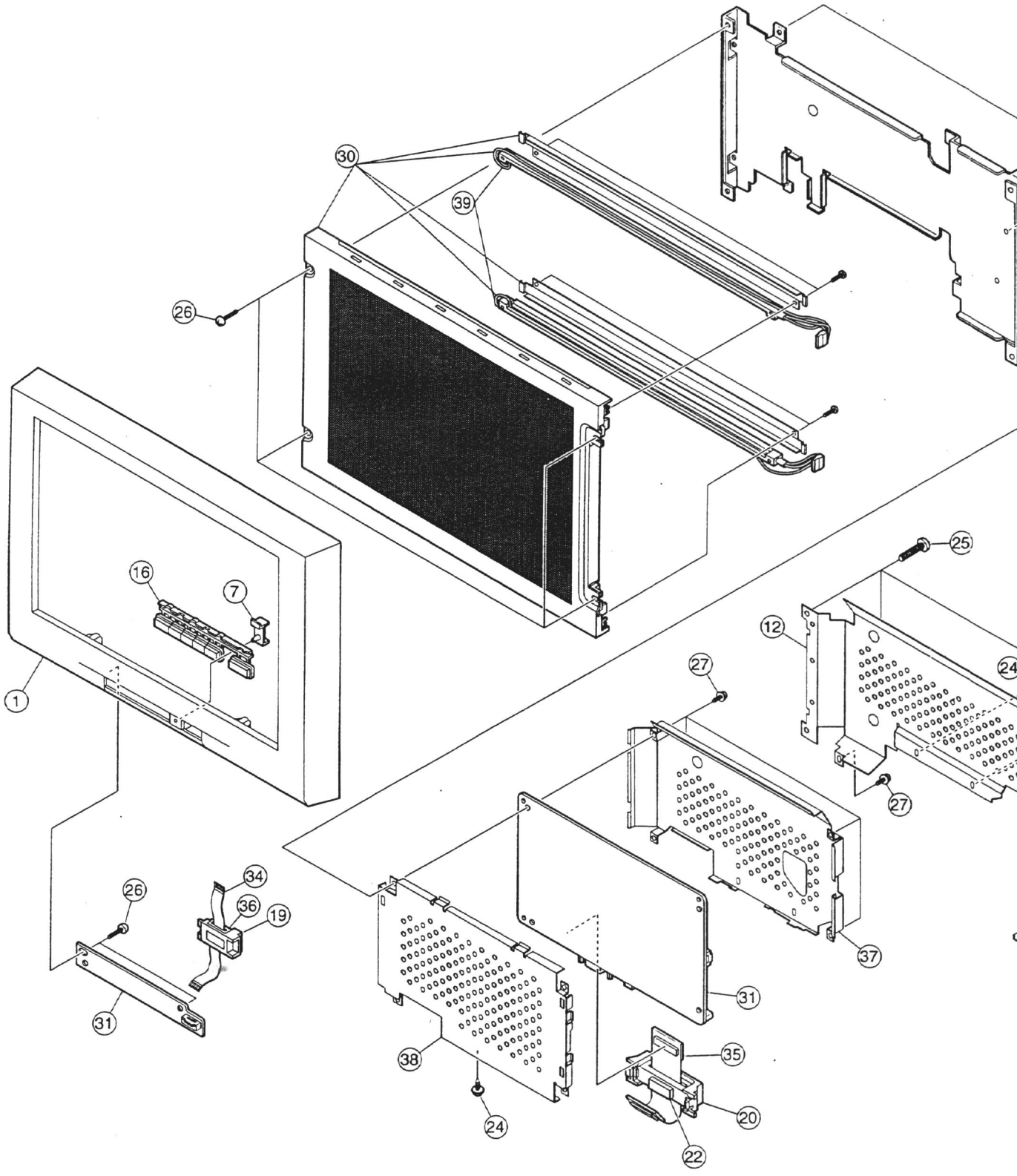
TNPH0128

VP140

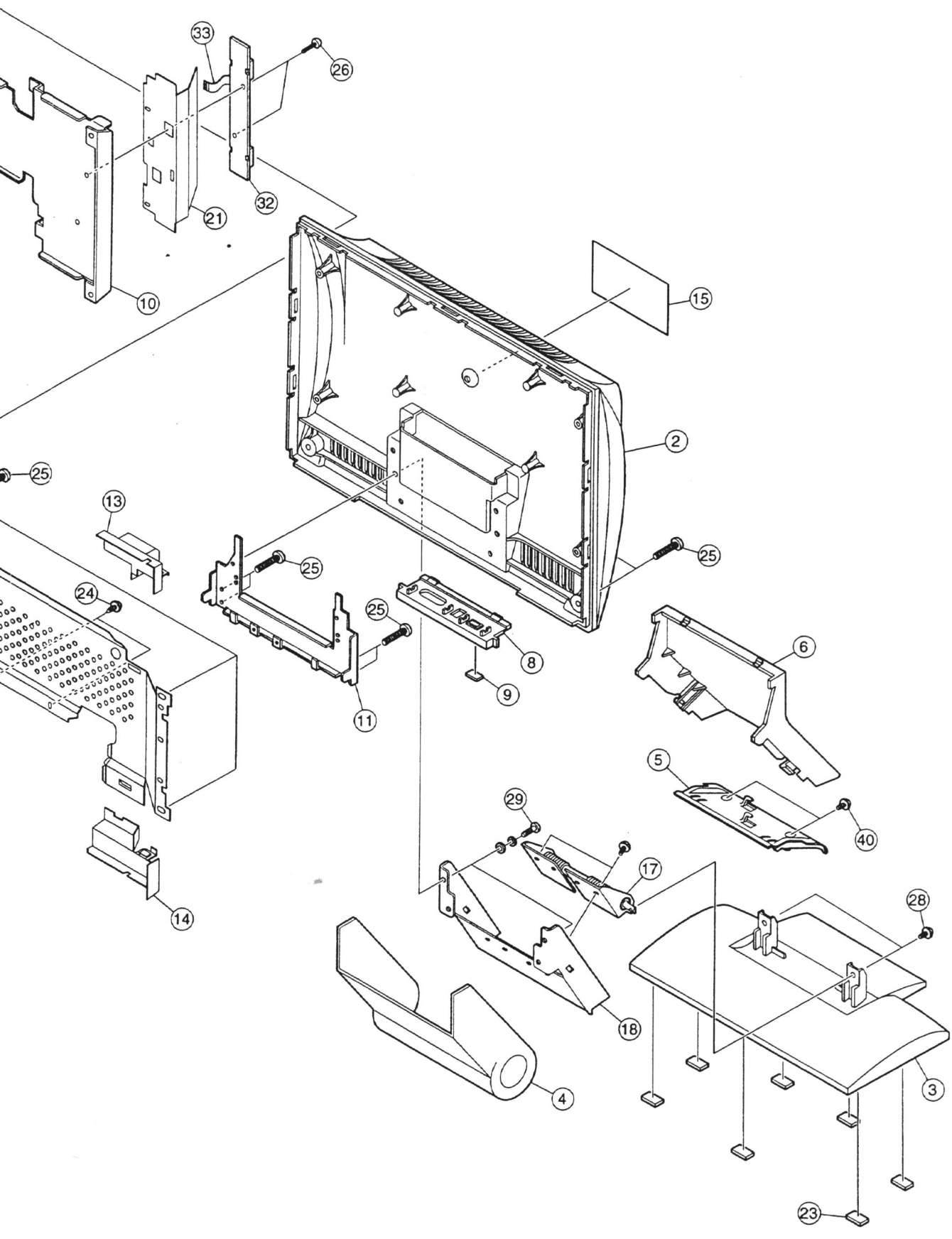

CN1
SL08R_1
TP1
TP2
TP3
TP4
TP5
TP6
TP7
+14V
+14V
GND
GND
LIGHT_OFF
GND
LIGHT_DAC
GND
Q1
FMC2
R1
220
Q2
MMSF3P03HD
C7
4.7
25V
R2
1.5K
R3
470
R4
910
R5
100K
ZD1
RD15
C28
0.1
25V
±10%
R27
220K
R30
22K
±1%
IC2
TL1451ACNS
Vref SCP IN+ IN- FB DT OUT VCC
CT RT IN+ IN- FB DT OUT GND
R32
100K
R34
100K
R33
100K
C24
0.1
25V
±10%
R28
220K
C26
680P
50V
±5%
C23
100
25V
±20%
R26
91K
R29
22K
±1%
C25
0.1
25V
±10%
C27
680P
50V
±5%
R31
15K
±1%
C1
0.1
50V
±5%
C29
0.1
25V
±10%
D11
DAN2
C21
0.1
25V
±10%
R23
5.1K
±1%
R22
6.8K
±1%
D9
DAN212K
IC1
uPC358G2
OUT1
OUT2
C11
1
50V
Q6
MMSF3P03HD
Q7
FMY1
R12
1.5K
R13
470
R14
910
R15
100K
ZD2
RD15
C35
0.1
25V
±10%
R37
220K
R39
22K
±1%
IC3
TL1451ACNS
Vref SCP IN+ IN- FB DT OUT VCC
CT RT IN+ IN- FB DT OUT GND
R42
100K
R44
100K
D10
DAN212K
C22
0.1
25V
±10%
R24
5.1K
±1%
C31
0.1
25V
±10%
R38
220K
C36
0.1
25V
±10%
R43
100K
C30
100
25V
±20%
R36
91K
C33
680P
50V
±5%
R40
22K
±1%
C32
0.1
25V
±10%
C34
680P
50V
±5%
R41
15K
±1%
R25
6.8K
±1%


Sheet ⑥
L1
CDRH125_820MC_TU
Q3
FMY1
D1
EC10QS04
D2
EC10QS04
R7
1.5K
1/2W
TP8
Q4
FX504
TP10
TP14
T1
RDT_0361
C5
22P
3KV
±5%
CN2
SM04(4.0)B_BHS_1
R6
1.5K
1/2W
R3
470
C2
0.01
50V
±10%
C4
0.01
50V
±10%
C3
0.1
50V
±5%
HIGH
HIGH
C6
22P
3KV
±5%
TP15
LOW
R46
330
ZD1
RD15.0MB2
R8
1.1K
R35
16K
TP12
R10
18K
±1%
C10
0.1
25V
±10%
C9
0.01
50V
±10%
D4
DAN217
R11
4.7K
±1%
C8
0.1
25V
±10%
R9
430
±1%
D11
DAN212K
C11
1
50V ±20%
L2
CDRH125_820MC_TU
Q7
FMY1
C14
0.01
50V
±10%
R17
1.5K
1/2W
Q8
FX504
TP9
TP11
TP16
R47
330
D6
EC10QS04
R16
1.5K
1/2W
T2
RDT_0361
C15
22P
3KV
±5%
CN3
SM04(4.0)B_BHS_1
C12
0.01
50V
±10%
C13
0.1
50V
±5%
HIGH
HIGH
C16
22P
3KV
±5%
D5
EC10QS04
ZD2
RD15.0MB2
TP17
LOW
R18
1.1K
R45
16K
TP13
R20
18K
±1%
C20
0.1
25V
±10%
C19
0.01
50V
±10%
D8
DAN217
R21
4.7K
±1%
C18
0.1
25V
±10%
R19
430
±1%
D12
DAN212K
TNAD005

EXPLODED V



ODED VIEW



ViewSonic Corporation

REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by the International symbol ⚠ have special characteristics important for safety. When replacing any of these components use only manufacture's specified parts.

RESISTOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Carbon	F	± 1%
F	Fuse	J	± 5%
M	Metal Oxide	K	± 10%
S	Solid	M	± 20%
W	Wire Wound	G	± 2%

Part No. Description

Example: ERD25TJ104 (C) 100K (J) 1/4W

CAPACITOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Ceramic	C	± 0.25pF
E	Electrolytic	D	± 0.5pF
P	Polyester	F	± 1pF
S	Styrol	J	± 5%
T	Tantalum	K	± 10%
PP	Polypropylene	L	± 15%
		M	± 20%
		P	+100% – 0%
		Z	+80% – 20%

Part No. Description

Example: ECKF1H103ZF (C) 0.01μF (Z) 50V

	Ref.No.	Part No.	Description
		CABINET & MAIN PARTS	
⚠	1	TTYA07901-4	ESCUTCHEON
⚠	2	TKUC03701	REAR COVER
	3	TKCX015	TILT BASE
⚠	4	TKXA01801	TILT COVER(FRONT)
⚠	5	TKXA01901	TILT COVER(REAR)
⚠	6	TKXA02001	CABLE COVER
⚠	7	TKKC5040	LED GUIDE
⚠	8	TKKL5018-1	TERMINAL COVER
	9	TKK859745	CONNECTOR COVER
	10	TUAA05301	LCD PANEL BRACKET
	11	TKZX5015	PROTECTOR
	12	TUCC5205	SHIELD CASE
	13	TUCC5206-1	SHIELD PLATE(UPPER)
	14	TUCC5207	SHIELD PLATE(BOTTOM)
⚠	15	TBMC834	MODEL NAME LABEL
⚠	16	TBXA09401	KNOB(CONTROL)
	17	TEJA003	TILT SHAFT
	18	TEJC001	ARM
⚠	19	TMXC002	FERRITE CORE HOLDER
⚠	20	TMXC003	FERRITE CORE HOLDER(BIG)
⚠	21	TMKE072	INVERTER PCB BARRIER
	22	TMKG077	CUSHION RUBBER
	23	TMKK039-1	SET LEG
	24	THT1069	SCREW(FOR SHIELD CASE)
	25	XTB4+16G	SCREW
	40	XTV3+12J	SCREW
	26	XTV3+10J	SCREW
	27	XYA4+EF8	SCREW
	28	XYN4+F10	SCREW
	29	XYN4+F12	SCREW
⚠	30	EDTCF01QDF	LIQUID CRYSTAL DISPLAY
	31	TXANP14L31NM	PC BOARD W/COMPONENT (MAIN)
⚠	32	TNAD005	PC BOARD W/COMPONENT (INVERTER)
⚠		TNQX010C	AC ADAPTOR
⚠		TSXA014	POWER CORD<-E>
⚠		TSXA023	POWER CORD<-M>
		TSXF051-1	SIGNAL CORD
	33	TSXL034	FLAT CORD(8P)
	34	TSXL035	FLAT CORD(9P)
⚠	35	TSXL039	FLEXIBLE PC BOARD
	36	TSKA090	FERRITE CORE(SMALL)
		TPCA4550I	OUTER CARTON
		TPDF0185	CARTON SPACER
		TXAPD1D4L31	FILLER
		TPEH040	SET COVER
		TQE8513-2	FUN BAG COVER
⚠		TQBE0136	INSTRUCTION BOOK
		TQDE14012	REGISTRATION CARD<-M>
		TQFA343	BAR CODE LABEL
		TQF83825-6	SERIAL NO. LABEL
		TQF85210	HIGH VOLTAGE LABEL
		TQF85363-1	CARTON LABEL<-M>
		TQF85363-8	CARTON LABEL<-E>
	39	LXF03ZF01OD	FLUORESCENT LAMP ASSY (UPPER AND BUTTOM)
		I.C	
	IC100	TVRB026-1	IC
	IC120	24LC08BTISN	IC
	IC150	CXA1875AM	IC
	IC170	CXA1875AM	IC
	IC200	TVSA0126	IC
	IC202	TVSA0130	IC
	IC203	TVSA0126	IC
	IC204	AN78L05M-E1	IC
	IC852	PQ12TZ1U	IC
	IC853	PQ05TZ5U	IC
	IC854	TVSF0013	TRANSISTOR
	IC855	L78LR05C	IC
	IC860	PQ1CZ1T	IC
	IC861	PQ1CZ1T	IC

Ref.No.	Part No.	Description
IC1300	M52307SP	IC
IC1320	24LC21TISN	IC
IC1400	M35042-088SP	IC
IC6000	TVSA0145	IC
IC6100	TVSA0145	IC
IC6200	TVSA0145	IC
IC6300	TDA8703T	IC
IC6310	TDA8703T	IC
IC6400	TDA8703T	IC
IC6410	TDA8703T	IC
IC6500	TDA8703T	IC
IC6510	TDA8703T	IC
IC6600	TVSA0131	IC
IC6601	TVSA0128	IC
IC6602	TVSA0127	IC
IC6610	LM6132BIMX	IC
IC6630	AN78L05M-E1	IC
IC6650	TVSA0131	IC
IC6651	TVSA0127	IC
IC6700	TVSA0128	IC
IC6701	TVSA0129	IC
IC6702	TVSA0128	IC
IC6703	TVSA0128	IC
IC6704	TVSA0128	IC
IC6705	TVSA0128	IC
IC6706	TVSA0128	IC
IC6707	TVSA0129	IC
IC6708	TVSA0127	IC
	TRANSISTORS	
Q100	UN2111	TRANSISTOR
Q101	UN2111	TRANSISTOR
Q200	UN5211AI	TRANSISTOR
Q201	UN5211AI	TRANSISTOR
Q202	UN5111AI	TRANSISTOR
Q203	2SD601AQ	TRANSISTOR
Q204	2SD601AQ	TRANSISTOR
Q205	2SD601AQ	TRANSISTOR
Q220	UN5211AI	TRANSISTOR
Q221	2SD601AQ	TRANSISTOR
Q260	2SD601AQ	TRANSISTOR
Q270	UN5111AI	TRANSISTOR
Q1000	2SC3938R	TRANSISTOR
Q1001	2SA1739R	TRANSISTOR
Q1002	2SD601AQ	TRANSISTOR
Q1003	2SC3938R	TRANSISTOR
Q1004	2SA1739R	TRANSISTOR
Q1005	2SD601AQ	TRANSISTOR
Q1006	2SC3938R	TRANSISTOR
Q1100	2SC3938R	TRANSISTOR
Q1101	2SA1739R	TRANSISTOR
Q1102	2SD601AQ	TRANSISTOR
Q1103	2SC3938R	TRANSISTOR
Q1104	2SA1739R	TRANSISTOR
Q1105	2SD601AQ	TRANSISTOR
Q1106	2SC3938R	TRANSISTOR
Q1200	2SC3938R	TRANSISTOR
Q1201	2SA1739R	TRANSISTOR
Q1202	2SD601AQ	TRANSISTOR
Q1203	2SC3938R	TRANSISTOR
Q1204	2SA1739R	TRANSISTOR
Q1205	2SD601AQ	TRANSISTOR
Q1206	2SC3938R	TRANSISTOR
Q1310	2SD601AQ	TRANSISTOR
Q6631	2SC4270	TRANSISTOR
	DIODES	
D100	MA157A	DIODE
D101	MA157A	DIODE
D102	MA157A	DIODE
D103	MA151K	DIODE
D104	MA704	DIODE
D105	MA157A	DIODE
D106	MA157A	DIODE
D107	MA157A	DIODE
D108	MA157A	DIODE
D109	MA151WK	DIODE
D200	MA8056M	DIODE
D201	MA8056M	DIODE
D202	MA111	DIODE
D203	MA111	DIODE
D210	MA151WK	DIODE
D220	MA111	DIODE
D221	MA728	DIODE
D222	MA8056M	DIODE
D270	MA8056M	DIODE
D271	MA8056M	DIODE
D272	MA8051M	DIODE
D860	MA737	DIODE
D861	MA737	DIODE
D862	MA8056M	DIODE
D863	MA8056M	DIODE
D864	MA8039L	DIODE
D870	SEC2764C	DIODE(LED)
D1000	MA157A	DIODE
D1100	MA157A	DIODE
D1200	MA157A	DIODE
D1320	MA8056M	DIODE
D1321	MA8056M	DIODE
D6601	MA728	DIODE
D6630	MA374TXFD	DIODE
D6631	MA374TXFD	DIODE
	COIL & TRANSFORMERS	
L100	ELJFA101JB	CHIP COIL
L200	TAX10073	NOISE FILTER
L201	TAX10073	NOISE FILTER
L850	TLPD021	LINE FILTER
L851	TLPD021	LINE FILTER
L853	TAXX0014	NOISE FILTER
L854	TAXX0014	NOISE FILTER
L855	ELC10D181E	CHOKE COIL
L856	TAXX0014	NOISE FILTER
L857	ELC10D221E	CHOKE COIL
L870	TAX10094	NOISE FILTER
L871	TAX10094	NOISE FILTER
L872	TAX10094	NOISE FILTER
L1000	TAXK0010	NOISE FILTER
L1001	ELJFA4R7MB	CHIP COIL
L1002	ELJNA3R3JB	CHIP COIL
L1100	TAXK0010	NOISE FILTER
L1101	ELJFA4R7MB	CHIP COIL
L1102	ELJNA3R3JB	CHIP COIL
L1200	TAXK0010	NOISE FILTER

Ref.No.	Part No.	Description
L1201	ELJFA4R7MB	CHIP COIL
L1202	ELJNA3R3JB	CHIP COIL
L6000	TSK8029-1	FERRITE CORE
L6020	TAXF0013	NOISE FILTER
L6021	TAXF0013	NOISE FILTER
L6022	TAXF0013	NOISE FILTER
L6023	TAXF0013	NOISE FILTER
L6024	TAXF0013	NOISE FILTER
L6025	TAXF0013	NOISE FILTER
L6030	TAXF0013	NOISE FILTER
L6031	TAXF0013	NOISE FILTER
L6032	TAXF0013	NOISE FILTER
L6033	TAXF0013	NOISE FILTER
L6034	TAXF0013	NOISE FILTER
L6035	TAXF0013	NOISE FILTER
L6100	TSK8029-1	FERRITE CORE
L6120	TAXF0013	NOISE FILTER
L6121	TAXF0013	NOISE FILTER
L6122	TAXF0013	NOISE FILTER
L6123	TAXF0013	NOISE FILTER
L6124	TAXF0013	NOISE FILTER
L6125	TAXF0013	NOISE FILTER
L6130	TAXF0013	NOISE FILTER
L6131	TAXF0013	NOISE FILTER
L6132	TAXF0013	NOISE FILTER
L6133	TAXF0013	NOISE FILTER
L6134	TAXF0013	NOISE FILTER
L6135	TAXF0013	NOISE FILTER
L6200	TSK8029-1	FERRITE CORE
L6220	TAXF0013	NOISE FILTER
L6221	TAXF0013	NOISE FILTER
L6222	TAXF0013	NOISE FILTER
L6223	TAXF0013	NOISE FILTER
L6224	TAXF0013	NOISE FILTER
L6225	TAXF0013	NOISE FILTER
L6230	TAXF0013	NOISE FILTER
L6231	TAXF0013	NOISE FILTER
L6232	TAXF0013	NOISE FILTER
L6233	TAXF0013	NOISE FILTER
L6234	TAXF0013	NOISE FILTER
L6235	TAXF0013	NOISE FILTER
L6300	ELJPA100KB	CHIP COIL
L6310	ELJPA100KB	CHIP COIL
L6600	ELJFA101JB	CHIP COIL
L6601	ELJNDR27JB	CHIP COIL
L6650	ELJFA101JB	CHIP COIL
L6651	ELJFA101JB	CHIP COIL
L6680	TAX10116	NOISE FILTER
L6700	ELJPA100KB	CHIP COIL
L6710	TAXF0013	NOISE FILTER
L6712	TAXF0013	NOISE FILTER
L6713	TAXF0013	NOISE FILTER
L6714	TAXF0013	NOISE FILTER
L6715	TAXF0013	NOISE FILTER
L6720	TAXF0013	NOISE FILTER
L6730	TAXF0013	NOISE FILTER
L6731	TAXF0013	NOISE FILTER
L6732	TAXF0013	NOISE FILTER
L6750	TAXX0014	NOISE FILTER

CAPACITORS

C104	ECUX1H220JCN	C	22PF	J	50V

Ref.No.	Part No.				
C105	ECUX1C105ZFX	C	1UF	Z	16V
C107	ECUX1H220JCN	C	22PF	J	50V
C108	ECUX1H220JCN	C	22PF	J	50V
C109	ECUX1H220JCN	C	22PF	J	50V
C110	ECUX1C105ZFX	C	1UF	Z	16V
C111	ECUX1C105ZFX	C	1UF	Z	16V
C112	ECUX1H101JCG	C	100PF	J	50V
C113	ECUX1H101JCG	C	100PF	J	50V
C114	ECUX1H101JCG	C	100PF	J	50V
C115	ECUX1H101JCG	C	100PF	J	50V
C120	ECUX1H104ZFX	C	0.1UF	Z	50V
C150	ECUX1H104ZFX	C	0.1UF	Z	50V
C170	ECUX1H104ZFX	C	0.1UF	Z	50V
C200	ECEV1CG4R7N	E	4.7UF		16V
C201	ECEV1CG4R7N	E	4.7UF		16V
C202	ECEV1CG4R7N	E	4.7UF		16V
C203	ECUX1C105ZFX	C	1UF	Z	16V
C204	ECEV1HG2R2G	E	2.2UF		50V
C205	ECEV1HG2R2G	E	2.2UF		50V
C207	ECUX1H102KBN	C	1000PF	K	50V
C208	ECUX1H102KBN	C	1000PF	K	50V
C209	ECUX1H221JCG	C	220PF	J	50V
C210	ECEV1CG470G	E	47UF		16V
C211	ECUX1H104ZFX	C	0.1UF	Z	50V
C213	ECUX1H104ZFX	C	0.1UF	Z	50V
C215	ECUX1H150JCN	C	15PF	J	50V
C216	ECEV1CG4R7N	E	4.7UF		16V
C217	ECUX1C105ZFX	C	1UF	Z	16V
C218	ECEV1HG2R2G	E	2.2UF		50V
C219	ECUX1H104ZFX	C	0.1UF	Z	50V
C220	ECEV1CG470G	E	47UF		16V
C221	ECEV1CG100G	E	10UF		16V
C223	ECUX1H101JCG	C	100PF	J	50V
C224	ECUX1H101JCG	C	100PF	J	50V
C225	ECUX1C105ZFX	C	1UF	Z	16V
C226	ECEV1CG4R7N	E	4.7UF		16V
C227	ECUX1C104KBX	C	0.1UF	K	16V
C272	ECUX1C105ZFX	C	1UF	Z	16V
C849	ECEV1CG470G	E	47UF		16V
C850	ECUX1H103KBG	C	0.01UF	K	50V
C851	ECEV1CG470G	E	47UF		16V
C853	ECEV1CG470G	E	47UF		16V
C854	ECUX1H101JCG	C	100PF	J	50V
C856	ECEV1CG470G	E	47UF		16V
C857	ECEV1CG470G	E	47UF		16V
C858	ECEV1CG470G	E	47UF		16V
C859	ECEV1CG470G	E	47UF		16V
C860	ECUX1C105ZFX	C	1UF	Z	16V
C861	ECUX1H103KBG	C	0.01UF	K	50V
C862	ECEV1CG470G	E	47UF		16V
C863	ECEV1CG470G	E	47UF		16V
C864	ECUX1C105ZFX	C	1UF	Z	16V
C865	ECA1EHG471	E	470UF		25V
C868	ECUX1H104ZFX	C	0.1UF	Z	50V
C869	ECEV1CG470G	E	47UF		16V
C870	ECEV1CG470G	E	47UF		16V
C871	ECEV1CG470G	E	47UF		16V
C872	ECUX1C105ZFX	C	1UF	Z	16V
C873	EEUFC0J821	E	820UF		6.3V
C874	ECUX1H104ZFX	C	0.1UF	Z	50V
C876	ECUX1H562KBG	C	5600PF	K	50V
C1000	ECEV1CG470G	E	47UF		16V

Ref.No.	Part No.	Description				Ref.No.	Part No.	Description			
C1001	ECEV1CG470G	E	47UF		16V	C6302	ECUX1C105ZFX	C	1UF	Z	16V
C1002	ECUX1H104ZFX	C	0.1UF	Z	50V	C6303	ECUX1C105ZFX	C	1UF	Z	16V
C1003	ECUX1H100DCN	C	10PF	D	50V	C6304	ECUX1H223KBX	C	0.022UF	K	50V
C1004	ECUX1H330JCG	C	33PF	J	50V	C6305	ECUX1C105ZFX	C	1UF	Z	16V
C1010	ECEV1CG220N	E	22UF		16V	C6306	ECUX1H101JCG	C	100PF	J	50V
C1011	ECUX1H103KBG	C	0.01UF	K	50V	C6310	ECUX1C105ZFX	C	1UF	Z	16V
C1020	ECUX1C474ZFX	C	0.47UF	Z	16V	C6311	ECUX1C105ZFX	C	1UF	Z	16V
C1021	ECUX1H103KBG	C	0.01UF	K	50V	C6312	ECUX1C105ZFX	C	1UF	Z	16V
C1100	ECEV1CG470G	E	47UF		16V	C6313	ECUX1C105ZFX	C	1UF	Z	16V
C1101	ECEV1CG470G	E	47UF		16V	C6314	ECUX1H223KBX	C	0.022UF	K	50V
C1102	ECUX1H104ZFX	C	0.1UF	Z	50V	C6315	ECUX1C105ZFX	C	1UF	Z	16V
C1103	ECUX1H100DCN	C	10PF	D	50V	C6316	ECUX1H101JCG	C	100PF	J	50V
C1104	ECUX1H330JCG	C	33PF	J	50V	C6320	ECEV1CG470G	E	47UF		16V
C1110	ECEV1CG220N	E	22UF		16V	C6321	ECEV1CG470G	E	47UF		16V
C1111	ECUX1H103KBG	C	0.01UF	K	50V	C6400	ECUX1C105ZFX	C	1UF	Z	16V
C1120	ECUX1C474ZFX	C	0.47UF	Z	16V	C6401	ECUX1C105ZFX	C	1UF	Z	16V
C1121	ECUX1H103KBG	C	0.01UF	K	50V	C6402	ECUX1C105ZFX	C	1UF	Z	16V
C1200	ECEV1CG470G	E	47UF		16V	C6403	ECUX1C105ZFX	C	1UF	Z	16V
C1201	ECEV1CG470G	E	47UF		16V	C6404	ECUX1H223KBX	C	0.022UF	K	50V
C1202	ECUX1H104ZFX	C	0.1UF	Z	50V	C6405	ECUX1C105ZFX	C	1UF	Z	16V
C1203	ECUX1H100DCN	C	10PF	D	50V	C6406	ECUX1H101JCG	C	100PF	J	50V
C1204	ECUX1H330JCG	C	33PF	J	50V	C6410	ECUX1C105ZFX	C	1UF	Z	16V
C1210	ECEV1CG220N	E	22UF		16V	C6411	ECUX1C105ZFX	C	1UF	Z	16V
C1211	ECUX1H103KBG	C	0.01UF	K	50V	C6412	ECUX1C105ZFX	C	1UF	Z	16V
C1220	ECUX1C474ZFX	C	0.47UF	Z	16V	C6413	ECUX1C105ZFX	C	1UF	Z	16V
C1221	ECUX1H103KBG	C	0.01UF	K	50V	C6414	ECUX1H223KBX	C	0.022UF	K	50V
C1300	ECEV1CG470G	E	47UF		16V	C6415	ECUX1C105ZFX	C	1UF	Z	16V
C1301	ECUX1H104ZFX	C	0.1UF	Z	50V	C6416	ECUX1H101JCG	C	100PF	J	50V
C1302	ECUX1H103KBG	C	0.01UF	K	50V	C6500	ECUX1C105ZFX	C	1UF	Z	16V
C1303	ECUX1H103KBG	C	0.01UF	K	50V	C6501	ECUX1C105ZFX	C	1UF	Z	16V
C1320	ECUX1H103KBG	C	0.01UF	K	50V	C6502	ECUX1C105ZFX	C	1UF	Z	16V
C1325	ECUX1C105ZFX	C	1UF	Z	16V	C6503	ECUX1C105ZFX	C	1UF	Z	16V
C1400	ECUX1H103KBG	C	0.01UF	K	50V	C6504	ECUX1H223KBX	C	0.022UF	K	50V
C1401	ECUX1H104ZFX	C	0.1UF	Z	50V	C6505	ECUX1C105ZFX	C	1UF	Z	16V
C1402	ECEV1CG470G	E	47UF		16V	C6506	ECUX1H101JCG	C	100PF	J	50V
C1403	ECUX1H104ZFX	C	0.1UF	Z	50V	C6510	ECUX1C105ZFX	C	1UF	Z	16V
C6000	ECUX1H104ZFX	C	0.1UF	Z	50V	C6511	ECUX1C105ZFX	C	1UF	Z	16V
C6001	ECUX1H104ZFX	C	0.1UF	Z	50V	C6512	ECUX1C105ZFX	C	1UF	Z	16V
C6002	ECEV1CG470G	E	47UF		16V	C6513	ECUX1C105ZFX	C	1UF	Z	16V
C6003	ECUX1H104ZFX	C	0.1UF	Z	50V	C6514	ECUX1H223KBX	C	0.022UF	K	50V
C6004	ECUX1H104ZFX	C	0.1UF	Z	50V	C6515	ECUX1C105ZFX	C	1UF	Z	16V
C6005	ECUX1H104ZFX	C	0.1UF	Z	50V	C6516	ECUX1H101JCG	C	100PF	J	50V
C6006	ECUX1H104ZFX	C	0.1UF	Z	50V	C6600	ECEV1CG470G	E	47UF		16V
C6007	ECUX1H104ZFX	C	0.1UF	Z	50V	C6601	ECUX1C105ZFX	C	1UF	Z	16V
C6100	ECUX1H104ZFX	C	0.1UF	Z	50V	C6607	ECUX1H221JCG	C	220PF	J	50V
C6101	ECUX1H104ZFX	C	0.1UF	Z	50V	C6610	ECUX1H102KBN	C	1000PF	K	50V
C6102	ECEV1CG470G	E	47UF		16V	C6611	ECUX1H104ZFX	C	0.1UF	Z	50V
C6103	ECUX1H104ZFX	C	0.1UF	Z	50V	C6612	ECUX1H104ZFX	C	0.1UF	Z	50V
C6104	ECUX1H104ZFX	C	0.1UF	Z	50V	C6613	ECEV1CG220G	E	22UF		16V
C6105	ECUX1H104ZFX	C	0.1UF	Z	50V	C6630	ECEV1CG220G	E	22UF		16V
C6106	ECUX1H104ZFX	C	0.1UF	Z	50V	C6631	ECEV1CG220G	E	22UF		16V
C6107	ECUX1H104ZFX	C	0.1UF	Z	50V	C6632	ECUX1H101JCG	C	100PF	J	50V
C6200	ECUX1H104ZFX	C	0.1UF	Z	50V	C6633	ECUX1C224KBX	C	0.22UF	K	16V
C6201	ECUX1H104ZFX	C	0.1UF	Z	50V	C6634	ECUX1H104ZFX	C	0.1UF	Z	50V
C6202	ECEV1CG470G	E	47UF		16V	C6635	ECUX1H104ZFX	C	0.1UF	Z	50V
C6203	ECUX1H104ZFX	C	0.1UF	Z	50V	C6636	ECUX1H221JCG	C	220PF	J	50V
C6204	ECUX1H104ZFX	C	0.1UF	Z	50V	C6637	ECUX1H332KBN	C	3300PF	K	50V
C6205	ECUX1H104ZFX	C	0.1UF	Z	50V	C6638	ECUX1H332KBN	C	3300PF	K	50V
C6206	ECUX1H104ZFX	C	0.1UF	Z	50V	C6639	ECUX1H101JCG	C	100PF	J	50V
C6207	ECUX1H104ZFX	C	0.1UF	Z	50V	C6640	ECUX1H101JCG	C	100PF	J	50V
C6300	ECUX1C105ZFX	C	1UF	Z	16V	C6650	ECEV1CG470G	E	47UF		16V
C6301	ECUX1C105ZFX	C	1UF	Z	16V	C6651	ECUX1H104ZFX	C	0.1UF	Z	50V

Ref.No.	Part No.	Description			
C6652	ECUX1H102KBN	C	1000PF	K	50V
C6653	ECUX1H103KBG	C	0.01UF	K	50V
C6654	ECUX1H104ZFX	C	0.1UF	Z	50V
C6655	ECEV1CG470G	E	47UF		16V
C6656	ECUX1H473ZFX	C	0.047UF	Z	50V
C6670	ECUX1H104ZFX	C	0.1UF	Z	50V
C6700	ECUX1H104ZFX	C	0.1UF	Z	50V
C6701	ECUX1H104ZFX	C	0.1UF	Z	50V
C6702	ECUX1H104ZFX	C	0.1UF	Z	50V
C6703	ECUX1H104ZFX	C	0.1UF	Z	50V
C6704	ECUX1H104ZFX	C	0.1UF	Z	50V
C6705	ECUX1H104ZFX	C	0.1UF	Z	50V
C6706	ECUX1H104ZFX	C	0.1UF	Z	50V
C6707	ECUX1H104ZFX	C	0.1UF	Z	50V
C6708	ECUX1H104ZFX	C	0.1UF	Z	50V
C6720	ECEV1CG470G	E	47UF		16V
C6721	ECEV1CG470G	E	47UF		16V
C6722	ECEV1CG470G	E	47UF		16V
C6723	ECUX1H103KBG	C	0.01UF	K	50V
C6724	ECUX1H103KBG	C	0.01UF	K	50V
	RESISTORS				
R100	ERJ6GEYJ101	M	100 OHM	J	1/10W
R101	ERJ6GEYJ101	M	100 OHM	J	1/10W
R102	ERJ6GEYJ101	M	100 OHM	J	1/10W
R103	ERJ6GEYJ103	M	10K OHM	J	1/10W
R104	ERJ6GEYJ103	M	10K OHM	J	1/10W
R105	ERJ6GEYJ103	M	10K OHM	J	1/10W
R106	ERJ6GEYJ101	M	100 OHM	J	1/10W
R107	ERJ6GEYJ101	M	100 OHM	J	1/10W
R108	ERJ6GEYJ101	M	100 OHM	J	1/10W
R109	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R110	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R111	ERJ6GEYJ103	M	10K OHM	J	1/10W
R112	ERJ6GEYJ101	M	100 OHM	J	1/10W
R113	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R114	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R115	ERJ6GEYJ103	M	10K OHM	J	1/10W
R116	ERJ6GEYJ101	M	100 OHM	J	1/10W
R117	ERJ6GEYJ220	M	22 OHM	J	1/10W
R118	ERJ6GEYJ220	M	22 OHM	J	1/10W
R119	ERJ6GEYJ220	M	22 OHM	J	1/10W
R120	ERJ6GEYJ220	M	22 OHM	J	1/10W
R122	ERJ6GEYJ101	M	100 OHM	J	1/10W
R123	ERJ6GEYJ101	M	100 OHM	J	1/10W
R124	ERJ6GEYJ101	M	100 OHM	J	1/10W
R125	ERJ6GEYJ101	M	100 OHM	J	1/10W
R126	ERJ6GEYJ101	M	100 OHM	J	1/10W
R127	ERJ6GEYJ101	M	100 OHM	J	1/10W
R128	ERJ6GEY0R00	M	0 OHM		1/10W
R129	ERJ6GEYJ333	M	33K OHM	J	1/10W
R130	ERJ6GEYJ102	M	1K OHM	J	1/10W
R131	ERJ6GEYJ104	M	100K OHM	J	1/10W
R133	ERJ6GEYJ101	M	100 OHM	J	1/10W
R134	ERJ6GEYJ101	M	100 OHM	J	1/10W
R135	ERJ6GEYJ101	M	100 OHM	J	1/10W
R136	ERJ6GEY0R00	M	0 OHM		1/10W
R137	ERJ6GEYJ103	M	10K OHM	J	1/10W
R138	ERJ6GEYJ103	M	10K OHM	J	1/10W
R140	ERJ6ENF1782	M	17.8K OHM	F	1/10W
R141	ERJ6ENF1782	M	17.8K OHM	F	1/10W
R142	ERJ6ENF5621	M	5.62K OHM	F	1/10W
R143	ERJ6ENF5621	M	5.62K OHM	F	1/10W
R144	ERJ6ENF1182	M	11.8K OHM	F	1/10W
R145	ERJ6ENF1182	M	11.8K OHM	F	1/10W
R146	ERJ6ENF3242	M	32.4K OHM	F	1/10W
R147	ERJ6ENF3242	M	32.4K OHM	F	1/10W
R148	ERJ6GEYJ152	M	1.5K OHM	J	1/10W
R149	ERJ6GEYJ331	M	330 OHM	J	1/10W
R150	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R151	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R152	ERJ6GEYJ103	M	10K OHM	J	1/10W
R153	ERJ6GEYJ101	M	100 OHM	J	1/10W
R154	ERJ6GEYJ101	M	100 OHM	J	1/10W
R155	ERJ6GEYJ101	M	100 OHM	J	1/10W
R156	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R157	ERJ6ENF1502	M	15K OHM	F	1/10W
R158	ERJ6GEYJ101	M	100 OHM	J	1/10W
R159	ERJ6ENF1502	M	15K OHM	F	1/10W
R160	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R161	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R162	ERJ6GEYJ103	M	10K OHM	J	1/10W
R163	ERJ6GEY0R00	M	0 OHM		1/10W
R164	ERJ6GEY0R00	M	0 OHM		1/10W
R165	ERJ6GEY0R00	M	0 OHM		1/10W
R166	ERJ6GEYJ220	M	22 OHM	J	1/10W
R167	ERJ6GEYJ220	M	22 OHM	J	1/10W
R168	ERJ6GEYJ103	M	10K OHM	J	1/10W
R169	ERJ6GEYJ103	M	10K OHM	J	1/10W
R170	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R171	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R172	ERJ6GEYJ101	M	100 OHM	J	1/10W
R174	ERJ6GEYJ101	M	100 OHM	J	1/10W
R175	ERJ6ENF4701	M	4.7K OHM	F	1/10W
R176	ERJ6GEYJ103	M	10K OHM	J	1/10W
R177	ERJ6GEYJ183	M	18K OHM	J	1/10W
R178	ERJ6GEYJ183	M	18K OHM	J	1/10W
R179	ERJ6GEYJ183	M	18K OHM	J	1/10W
R180	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R181	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R183	ERJ6GEY0R00	M	0 OHM		1/10W
R184	ERJ6GEY0R00	M	0 OHM		1/10W
R185	ERJ6GEY0R00	M	0 OHM		1/10W
R186	ERJ6GEYJ220	M	22 OHM	J	1/10W
R187	ERJ6GEYJ220	M	22 OHM	J	1/10W
R188	ERJ6GEYJ562	M	5.6K OHM	J	1/10W
R189	ERJ6GEYJ103	M	10K OHM	J	1/10W
R190	ERJ6GEYJ103	M	10K OHM	J	1/10W
R191	ERJ6GEYJ103	M	10K OHM	J	1/10W
R192	ERJ6GEYJ103	M	10K OHM	J	1/10W
R193	ERJ6GEYJ103	M	10K OHM	J	1/10W
R194	ERJ6GEYJ101	M	100 OHM	J	1/10W
R195	ERJ6GEYJ101	M	100 OHM	J	1/10W
R196	ERJ6GEYJ101	M	100 OHM	J	1/10W
R197	ERJ6GEYJ101	M	100 OHM	J	1/10W
R198	ERJ6GEYJ101	M	100 OHM	J	1/10W
R199	ERJ6GEYJ102	M	1K OHM	J	1/10W
R200	ERJ6GEYJ473	M	47K OHM	J	1/10W
R201	ERJ6GEYJ101	M	100 OHM	J	1/10W
R202	ERJ6GEYJ101	M	100 OHM	J	1/10W
R203	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R204	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R205	ERJ6GEYJ102	M	1K OHM	J	1/10W
R209	ERJ6GEYJ562	M	5.6K OHM	J	1/10W

	Ref.No.	Part No.	Description
	F802	TSFX34A252	FUSE(2.5A)
	F803	TSFX33A202	FUSE(2.0A)
	FG1	TJE85316	LUG TERMINAL
	FG2	TJE85316	LUG TERMINAL
⚠	N100	EMCS0451ML	4P CONNECTOR(L-TYPE)
	N120	TJS8A9880	15P CONNECTOR
⚠	N850	TJS6A9650	DC SOCKET
⚠	N860	TJSF05408	8P CONNECTOR(L-TYPE)
⚠	N870A	TJSF05309	9P CONNECTOR
⚠	N870B	TJSF05409	9P CONNECTOR(L-TYPE)
⚠	N6000	TJSF22270	70P CONNECTOR
	SW870	EVQQH303W	SWITCH
	SW871	EVQQH303W	SWITCH
	SW872	EVQQH303W	SWITCH
	SW873	EVQQH303W	SWITCH
	SW874	EVQQH303W	SWITCH
	SW875	EVQQH303W	SWITCH
	X100	TSSA051	CRYSTAL OSCILLATOR

Ref.No.	Part No.	Description

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05/97 250 (N)

Ref.No.	Part No.	Description				Ref.No.	Part No.	Description			
R210	ERJ6GEYJ222	M	2.2K OHM	J	1/10W	R1012	ERJ6GEYJ103	M	10K OHM	J	1/10W
R212	ERJ6GEYJ123	M	12K OHM	J	1/10W	R1013	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R214	ERJ6GEYJ104	M	100K OHM	J	1/10W	R1014	ERJ6GEY0R00	M	0 OHM		1/10W
R215	ERJ6GEYJ102	M	1K OHM	J	1/10W	R1015	ERJ6GEYJ103	M	10K OHM	J	1/10W
R219	ERJ6GEYJ272	M	2.7K OHM	J	1/10W	R1016	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R221	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1017	ERJ6GEYJ560	M	56 OHM	J	1/10W
R222	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1019	ERJ6GEYJ681	M	680 OHM	J	1/10W
R223	ERJ6GEYJ101	M	100 OHM	J	1/10W	R1020	ERJ6GEYJ101	M	100 OHM	J	1/10W
R224	ERJ6GEYJ104	M	100K OHM	J	1/10W	R1021	ERJ6GEYJ101	M	100 OHM	J	1/10W
R225	ERJ6GEYJ822	M	8.2K OHM	J	1/10W	R1030	ERJ6GEYJ183	M	18K OHM	J	1/10W
R226	ERJ6GEYJ152	M	1.5K OHM	J	1/10W	R1031	ERJ6ENF2202	M	22K OHM	F	1/10W
R227	ERJ6GEYJ102	M	1K OHM	J	1/10W	R1032	ERJ6GEYJ273	M	27K OHM	J	1/10W
R228	ERJ6GEYJ101	M	100 OHM	J	1/10W	R1033	ERJ6ENF2702	M	27K OHM	F	1/10W
R229	ERJ6GEYJ473	M	47K OHM	J	1/10W	R1101	ERJ6GEYJ203	M	20K OHM	J	1/10W
R234	ERJ6GEY0R00	M	0 OHM		1/10W	R1102	ERJ6GEYJ203	M	20K OHM	J	1/10W
R236	ERJ6GEY0R00	M	0 OHM		1/10W	R1103	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R237	ERJ6GEY0R00	M	0 OHM		1/10W	R1104	ERJ6GEYJ331	M	330 OHM	J	1/10W
R239	ERJ6GEY0R00	M	0 OHM		1/10W	R1105	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R240	ERJ6GEY0R00	M	0 OHM		1/10W	R1106	ERJ12NF75R0	M	75 OHM	F	1/2W
R241	ERJ6GEYJ183	M	18K OHM	J	1/10W	R1107	ERJ6GEYJ103	M	10K OHM	J	1/10W
R242	ERJ6GEYJ183	M	18K OHM	J	1/10W	R1108	ERJ6GEYJ103	M	10K OHM	J	1/10W
R243	ERJ6GEYJ152	M	1.5K OHM	J	1/10W	R1109	ERJ6GEY0R00	M	0 OHM		1/10W
R244	ERJ6GEYJ152	M	1.5K OHM	J	1/10W	R1110	ERJ6GEYJ331	M	330 OHM	J	1/10W
R245	ERJ6GEYJ102	M	1K OHM	J	1/10W	R1112	ERJ6GEYJ103	M	10K OHM	J	1/10W
R250	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1113	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R251	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1114	ERJ6GEY0R00	M	0 OHM		1/10W
R252	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1115	ERJ6GEYJ103	M	10K OHM	J	1/10W
R253	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1116	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R254	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1117	ERJ6GEYJ560	M	56 OHM	J	1/10W
R255	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1119	ERJ6GEYJ681	M	680 OHM	J	1/10W
R256	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1120	ERJ6GEYJ101	M	100 OHM	J	1/10W
R257	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1121	ERJ6GEYJ101	M	100 OHM	J	1/10W
R263	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1130	ERJ6GEYJ183	M	18K OHM	J	1/10W
R264	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1131	ERJ6ENF1502	M	15K OHM	F	1/10W
R265	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1132	ERJ6GEYJ273	M	27K OHM	J	1/10W
R266	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1201	ERJ6GEYJ203	M	20K OHM	J	1/10W
R267	ERJ6GEYJ101	M	100 OHM	J	1/10W	R1202	ERJ6GEYJ203	M	20K OHM	J	1/10W
R268	ERJ6GEYJ392	M	3.9K OHM	J	1/10W	R1203	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R269	ERJ6GEYJ392	M	3.9K OHM	J	1/10W	R1204	ERJ6GEYJ331	M	330 OHM	J	1/10W
R270	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1205	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R271	ERJ6GEYJ102	M	1K OHM	J	1/10W	R1206	ERJ12NF75R0	M	75 OHM	F	1/2W
R272	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1207	ERJ6GEYJ103	M	10K OHM	J	1/10W
R854	ERJ6GEYJ102	M	1K OHM	J	1/10W	R1208	ERJ6GEYJ103	M	10K OHM	J	1/10W
R865	ERJ6GEY0R00	M	0 OHM		1/10W	R1209	ERJ6GEY0R00	M	0 OHM		1/10W
R866	ERJ6ENF3011	M	3.01K OHM	F	1/10W	R1210	ERJ6GEYJ331	M	330 OHM	J	1/10W
R867	ERJ6ENF1001	M	1K OHM	F	1/10W	R1212	ERJ6GEYJ103	M	10K OHM	J	1/10W
R868	ERJ6ENF1621	M	1.62K OHM	F	1/10W	R1213	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R869	ERJ6ENF1001	M	1K OHM	F	1/10W	R1214	ERJ6GEY0R00	M	0 OHM		1/10W
R870	ERJ6GEYJ102	M	1K OHM	J	1/10W	R1215	ERJ6GEYJ103	M	10K OHM	J	1/10W
R871	ERJ6GEYJ102	M	1K OHM	J	1/10W	R1216	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
R872	ERJ6GEYJ102	M	1K OHM	J	1/10W	R1217	ERJ6GEYJ560	M	56 OHM	J	1/10W
R876	ERJ6GEY0R00	M	0 OHM		1/10W	R1219	ERJ6GEYJ681	M	680 OHM	J	1/10W
R1001	ERJ6GEYJ203	M	20K OHM	J	1/10W	R1220	ERJ6GEYJ101	M	100 OHM	J	1/10W
R1002	ERJ6GEYJ203	M	20K OHM	J	1/10W	R1221	ERJ6GEYJ101	M	100 OHM	J	1/10W
R1003	ERJ6GEYJ182	M	1.8K OHM	J	1/10W	R1230	ERJ6GEYJ183	M	18K OHM	J	1/10W
R1004	ERJ6GEYJ331	M	330 OHM	J	1/10W	R1231	ERJ6ENF2202	M	22K OHM	F	1/10W
R1005	ERJ6GEYJ182	M	1.8K OHM	J	1/10W	R1232	ERJ6GEYJ273	M	27K OHM	J	1/10W
R1006	ERJ12NF75R0	M	75 OHM	F	1/2W	R1233	ERJ6ENF2702	M	27K OHM	F	1/10W
R1007	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1301	ERJ6GEYJ101	M	100 OHM	J	1/10W
R1008	ERJ6GEYJ103	M	10K OHM	J	1/10W	R1302	ERJ6ENF4021	M	4.02K OHM	F	1/10W
R1009	ERJ6GEY0R00	M	0 OHM		1/10W	R1303	ERJ6ENF1502	M	15K OHM	F	1/10W
R1010	ERJ6GEYJ331	M	330 OHM	J	1/10W	R1306	TAT107J683T	THERMISTOR			

Ref.No.	Part No.		Description		
R1307	ERJ6ENF2001	M	2K OHM	F	1/10W
R1308	ERJ6ENF1002	M	10K OHM	F	1/10W
R1310	ERJ6GEYJ103	M	10K OHM	J	1/10W
R1311	ERJ6GEYJ103	M	10K OHM	J	1/10W
R1312	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R1313	ERJ8GCY0R00	M	0 OHM		1/8W
R1320	ERJ6GEYJ473	M	47K OHM	J	1/10W
R1321	ERJ6GEYJ473	M	47K OHM	J	1/10W
R1322	ERJ6GEYJ331	M	330 OHM	J	1/10W
R1323	ERJ6GEYJ331	M	330 OHM	J	1/10W
R1400	ERJ6GEYJ104	M	100K OHM	J	1/10W
R1401	ERJ6GEY0R00	M	0 OHM		1/10W
R1402	ERJ6GEY0R00	M	0 OHM		1/10W
R6001	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6002	ERJ6GEY0R00	M	0 OHM		1/10W
R6004	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6005	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6006	ERJ6GEYJ103	M	10K OHM	J	1/10W
R6010	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6101	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6104	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6105	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6106	ERJ6GEYJ103	M	10K OHM	J	1/10W
R6110	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6200	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6201	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6202	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6203	ERJ6GEY0R00	M	0 OHM		1/10W
R6204	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6205	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6206	ERJ6GEYJ103	M	10K OHM	J	1/10W
R6207	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6208	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6209	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6210	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6300	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6302	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6303	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R6304	ERJ6GEY0R00	M	0 OHM		1/10W
R6305	ERJ6GEYJ220	M	22 OHM	J	1/10W
R6310	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6312	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6313	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R6314	ERJ6GEY0R00	M	0 OHM		1/10W
R6315	ERJ6GEYJ220	M	22 OHM	J	1/10W
R6400	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6402	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6403	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R6404	ERJ6GEY0R00	M	0 OHM		1/10W
R6405	ERJ6GEYJ220	M	22 OHM	J	1/10W
R6410	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6412	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6413	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R6414	ERJ6GEY0R00	M	0 OHM		1/10W
R6415	ERJ6GEYJ220	M	22 OHM	J	1/10W
R6500	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6502	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6503	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R6504	ERJ6GEY0R00	M	0 OHM		1/10W
R6505	ERJ6GEYJ220	M	22 OHM	J	1/10W
R6510	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6512	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6513	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R6514	ERJ6GEY0R00	M	0 OHM		1/10W
R6515	ERJ6GEYJ220	M	22 OHM	J	1/10W
R6601	ERJ6GEYJ100	M	10 OHM	J	1/10W
R6602	ERJ6GEYJ100	M	10 OHM	J	1/10W
R6604	ERJ6GEYJ103	M	10K OHM	J	1/10W
R6605	ERJ6GEY0R00	M	0 OHM		1/10W
R6606	ERJ6GEYJ100	M	10 OHM	J	1/10W
R6607	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6610	ERJ6GEY0R00	M	0 OHM		1/10W
R6613	ERJ6GEYJ223	M	22K OHM	J	1/10W
R6617	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R6618	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R6619	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6620	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6621	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6626	ERJ6GEYJ103	M	10K OHM	J	1/10W
R6627	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6628	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6629	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6630	ERJ6GEYJ105	M	1M OHM	J	1/10W
R6631	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R6632	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R6633	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R6634	ERJ6GEYJ181	M	180 OHM	J	1/10W
R6635	ERJ6GEYJ471	M	470 OHM	J	1/10W
R6636	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6637	ERJ6GEYJ153	M	15K OHM	J	1/10W
R6638	ERJ6GEYJ104	M	100K OHM	J	1/10W
R6639	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6640	ERJ6GEY0R00	M	0 OHM		1/10W
R6641	TAR114J0470H	F	47 OHM	J	1/10W
R6650	ERJ6GEYJ103	M	10K OHM	J	1/10W
R6651	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6652	ERJ6GEYJ471	M	470 OHM	J	1/10W
R6653	ERJ6GEYJ104	M	100K OHM	J	1/10W
R6655	ERJ6GEYJ154	M	150K OHM	J	1/10W
R6657	ERJ6GEYJ102	M	1K OHM	J	1/10W
R6658	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R6661	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6662	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6663	ERJ6GEYJ101	M	100 OHM	J	1/10W
R6670	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6671	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6672	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6680	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6681	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6702	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6703	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6704	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6705	ERJ6GEYJ560	M	56 OHM	J	1/10W
R6706	ERJ6GEYJ103	M	10K OHM	J	1/10W
R6708	ERJ6GEYJ103	M	10K OHM	J	1/10W
R6709	ERJ6GEYJ560	M	56 OHM	J	1/10W

OTHERS

24	THT1069	SCREW(FOR SHIELD PLATE)
	TJTX001	HEXAGON POST(D-SUB SCREW)
	TUCC5204-1	CONNECTOR BRACKET
37	TUCC5208-1	SHIELD CASE(MAIN PCB)
38	TUCC5209-1	SHIELD PLATE(MAIN PCB)
F801	TSFX32A631	FUSE(0.63A)

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TABLE OF CONTENTS

VP140

1. SERVICE, SAFETY & ADJUSTMENT PRECAUTIONS 1

2. INTRODUCTION 2

3. GENERAL DESCRIPTION 4

4. GENERAL INFORMATION 7

5. SPECIFICATIONS 8

BLOCK DIAGRAM 8
OSD MENU FUNCTIONS 8
MECHANICAL 9
CONNECTORS 9
ELECTRICAL 10
POWER MANAGEMENT 11
TIMING 12
DISPLAY 16
ENVIRONMENTAL 18
LCD 19
REGULATORY 20
DIMENSIONS 22

6. DISASSEMBLY INSTRUCTIONS 23

7. CONTROLS 25

8. ADJUSTMENT - TOOLS & TEST EQUIPMENT 27

9. ADJUSTMENT - SOFTWARE 29

10. ADJUSTMENT - PROCEDURE 30

11. ADJUSTMENT - CONDITIONS 31

12. TROUBLESHOOTING GUIDE 33

13. BLOCK DIAGRAMS 36

14. PCB LAYOUT 40

15. SCHEMATIC DIAGRAMS 42

16. EXPLODED PARTS VIEW 49

17. SPARE PARTS LIST 50

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.

It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.

Products powered by electricity should be serviced or repaired only by experienced professional technicians.

Any attempt to service or repair the product or products dealt within this service information by anyone else could result in serious injury or death.

SAFETY PRECAUTIONS

1 CAUTION:

No modification of any circuit should be attempted. Service work should only be performed after you are thoroughly familiar with all of the following safety checks and servicing guide lines.

2 SAFETY CHECK

Care should be taken while servicing this LCD monitor because of the high voltage used in the inverter circuits.

3 FIRE & SHOCK HAZARD

3-1 In servicing pay attention to original lead dress especially in the high voltage circuit. If a short circuit is found, replace all parts which have been overheated as a result of the short circuit.

3-2 All the protective devices must be reinstalled per original design.

3-3 Soldering must be inspected for possible cold solder joints, frayed leads, damaged insulation, solder splashes or sharp solder points. Be certain to remove all foreign material.

4 LEAKAGE CURRENT HOT CHECK

4-1 Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during this check.

4-2 Connect a 1500 ohm, 10 watt resistor, paralleled by a 0.15μF capacitor between each exposed metallic part and a good earth ground (as shown in Fig.1).

4-3 Use an AC voltmeter with 1000 ohm/volt or more sensitivity and measure the AC voltage across the combination 1500 ohm resistor and 0.15μF capacitor.

4-4 Move the resistor connection to each exposed metallic part and measure the voltage.

4-5 Reverse the polarity of the AC plug in the AC outlet and repeat the above measurement.

4-6 Voltage measured must not exceed 7.5 volt RMS. from any exposed metallic part to ground A leakage current tester may be used in the above hot check, in which case any current measured must not exceed 5.0 milliamp. In the case of a measurement exceeding the 5.0 milliamp value, a rework is required to eliminate the chance of a shock hazard.

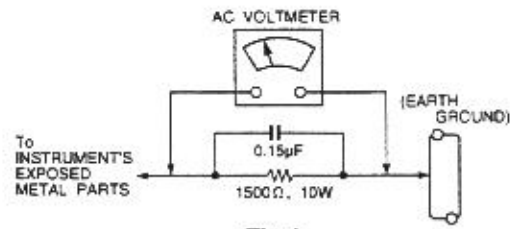

Fig.1

CAUTION FOR ADJUSTMENT AND REPAIR

1. If you check or adjust electrical specification or function, more than 30 minutes burn-in is required.
2. Reforming of the lead wire is required after your repair work.
3. Prior to starting work, be sure to check that the input signal is at the specified timing and that the polarity is as specified in all modes.
4. Always unplug the unit before beginning any operation such as removing the chassis.
5. Brightness stabilizing time: It takes about 20 to 50 seconds for the brightness to stabilize after turning the power off for 5 seconds (AC). Therefore, care should be taken to this.

INTRODUCTION

1 The Liquid Crystal Display (LCD) monitor falls under one of the innovative technological commodity fields, and the maintenance service of the product partly needs new repairing techniques.
Since our user service system should be offered as quickly as possible, it is necessary to provice new technological information concerning the product.
More concretely, this new technology relates to that to convert from analog to digital systems. To our regret, however, it is rather difficult to supply all the service information at this stage of development.

2 Under these circumstances, the service procedures are divided into the two steps, STEP-1 and STEP-2, by making use of the characteristics of the LCD monitor, as described below.

- Step 1: To replace Main PCB.
- Step 2: To repair the Main PCB interior.

Characteristics of servicing of LCD monitors

- An LCD monitor can be divided roughly into an LCD panel unit and a main PCB.
- The LCD panel uses digital signals to show pictures on a screen. The main PCB converts analog signals produced from a computer into digital ones and reproduces them on the LCD panel. This means an addition of digital signals to the LCD panel allows a picture to be shown on the screen.
- If the digital signals which are produced from the main PCB are normal, the LCD panel will show a normal picture.
  Since digital signals are transmitted and received between the LCD panel and the main PCB without needing any particular connecting techniques, no particular adjustment will be needed even if either the LCD panel or the main PCB is replaced with a new one.

3 Concrete description of STEP-1 and STEP-2 of the customer service

Classification	Item	STEP-1	STEP-2
Assistance to servicing	Service manual	To be issued in June 1997	To be issued in August 1997
	Adjusting procedures (*1)	Data setting only	Adjustment partly needed
	Servicing technical data	——	To be published upon preparation (August 1997)
Scope of parts replacement (*2)	Main PCB	Replacing a unit	Repair
	Fluorescent lamp	Replacing a unit	Replacing a unit
	Inverter PCB	Replacing a unit	Replacing a unit
	AC adapter	Replacing a unit	Replacing a unit

*1 Adjustment after replacing a part
No particular adjustment is needed even after any of the above-mentioned five units is replaced with a new one. However, data setting alone is needed if a main PCB is replaced.
On the other hand, adjustment is needed in part (brightness, sub-cont., 1.0V level adj.) if analog circuit parts are replaced at the video input stage of the main PCB interior.

*2 The scope of parts replacement
The following kinds of repair parts will be supplied in a following composition.

1) Main PCB
This is a PCB to convert analog signals coming from a computer into digital ones which an LCD panel unit needs. Although all the components in the PCB should preferably be repaired, we shall cope with recuests for repair by replacing a unit for the time being at the beginning of the servicing, because new repairing techniques are needed to repair all the components.

2) LCD panel unit
This unit receives digital signals from the main PCB and displays pictures on the screen. This unit is composed of an LCD panel, a panel-driving PCB, and fluorescent lamps. Neither the LCD panel nor the panel-driving PCB are repaired or supplied incependently.